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MESSAGE  
FROM  
THE PRESIDENT OF THE UNITED STATES  
TRANSMITTING  
NATIONAL RESOURCES DEVELOPMENT  
REPORT FOR 1942



JANUARY 14, 1942.—Referred to the Committee of the Whole House  
on the state of the Union and ordered to be printed with illustrations

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UNITED STATES  
GOVERNMENT PRINTING OFFICE  
WASHINGTON : 1942



To the Congress of the United States:

Plans and programs to win the war and to win the peace must grow out of our common national purpose and with democratic participation in planning by all of us. Through efforts to state our objectives and public discussion of their merits, we play our parts as free citizens. In that spirit, I am transmitting herewith for the information of the Congress the "Development of National Resources—Report for 1942," prepared by the National Resources Planning Board, continuing the series begun last year and establishing the custom of an annual planning report as a companion document to the Budget of the United States.

The National Resources Planning Board, as the planning arm of my Executive Office, is charged with the preparation of long-range plans for the development of our national resources and the stabilization of employment. At my direction, it is correlating plans and programs under consideration in many Federal, State, and private organizations for post-war full employment, security, and building America. In this report the Board outlines some of our major objectives in planning to win the peace.

To facilitate its use by the Congress, I recommend that this report on these plans and programs be printed, together with supporting illustrations and tables, in conformity with similar reports by the Board.

FRANKLIN D. ROOSEVELT.

The WHITE HOUSE,  
*January 14, 1942.*

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EXECUTIVE OFFICE OF THE PRESIDENT  
NATIONAL RESOURCES PLANNING BOARD  
WASHINGTON, D. C.

*December 16, 1941.*

The PRESIDENT,  
*The White House.*

MY DEAR MR. PRESIDENT: In accordance with your instructions, and continuing the custom established last year, we are transmitting herewith "National Resources Development—Report for 1942" of the National Resources Planning Board.

Part I of this report restates some major planning objectives, summarizes the planning activities of the Board in the war effort, and presents the lines of action to be explored and developed as elements of a post-war program.

Part II presents the Program of Public Works with a record of progress on public works planning.

Part III includes a series of policy statements, prepared by consultants and staff of the Board, on post-war planning in various fields.

Respectfully submitted,

FREDERIC A. DELANO, *Chairman.*  
CHARLES E. MERRIAM.  
GEORGE F. YANTIS.

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# NATIONAL RESOURCES DEVELOPMENT REPORT FOR 1942

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## INTRODUCTION

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The Program of the Nation is epitomized in the President's statement, "We are going to win the war and we are going to win the peace that follows." Like all other agencies of the Government, the activities of the National Resources Planning Board are concentrated on those two objectives.

**To win the War,** American energies are now directed toward the development of a vast production program, toward the mobilization as swiftly as possible of all the resources of the Nation, in materials and personnel, and toward aid for the democracies of the world in our joint struggle against aggression.

We are engaged in what is termed total war—a form of struggle in which all the resources of the States involved are hurled into the arena of conflict. The nature of modern technology, of transportation, of communication, of mechanical equipment, and of the resources required to feed both the men and the machines they operate has imposed this type of all-out national effort. This is not an occasion for wishing well feebly, but for complete use of all available forces, with American dynamism.

**To win the Peace,** we must prepare now—even while we are concentrating on winning the war. In a very real sense the clarification of our objectives for the onward march of freedom-loving people is an essential of our war effort. We are intent on winning this war, not only to safeguard our lives and our liberties, but also to make possible the "pursuit of happiness"—the full fruition of our hopes and plans for progress and development. We must fight the dictators and all their forces, not only with greater force, but with ideas and faith. We must develop with our own people and hold out to the enslaved people now under the heel of the dictators a better way of life than we or they have had.

We are not going back to the "status quo." We are going forward with restored confidence in the basic foundations of faith, decency, and liberty which underlie our civilization. One of the few certainties in the world is inevitable change. We could not stop the march of progress if we wanted to. But we can do something about the direction of the changes that will follow victory. For that reason we propose to plan ahead.

### Planning Organization

To plan ahead the National Resources Planning Board has been set-up as the planning arm of the Executive Office of the President. A new form of execu-

tive organization set up in 1939 established the Board as a part of the Executive Office of the President alongside the Bureau of the Budget, the Office of Government Reports, the President's Administrative Assistants, and the Office of Emergency Management. The Board thus became a standing advisory agency to the President in a wide range of national planning affairs, acting on immediate direction of the President or on the basis of an agenda approved by the President. Along with this came a reorganization of many of the regular departments and agencies of the government. Departmental planning agencies have been set up in several of the departments, notably in Agriculture and the Federal Security Agency.

Furthermore, since 1934 many other planning agencies have sprung up outside the Federal agencies. City planning boards have increased in number and broadened somewhat the scope of their activities; county planning boards to the number of 1,500 have arisen to deal chiefly with agricultural problems of land use. State planning boards now exist in some 45 States, and there are regional planning agencies in the Pacific Northwest, Missouri Valley, Southeast, New England, and many other sections of the country, most notable among them, the TVA. The Council of State Governments, commissions on interstate cooperation, and other like institutions are dealing with various aspects of the planning problem.

Beginning in 1940 special defense agencies were set up for the purpose of dealing with the national emergency. These, as is well known, began with the National Defense Advisory Commission. Later there emerged the Office of Production Management, The Lend-Lease Administration, Supplies Priorities and Allocation Board, and Economic Warfare Board with numerous subgroupings necessary for the practical operation of a system which would gear national production up to our defense needs. It was inevitable that this organization did not spring up complete and symmetrical in all its proportions and operations. It was necessarily tentative and experimental in its approach to the vast problem of arming at top speed a peaceful people reluctantly drawn into the world-wide struggle for national safety and for international justice and order.

The National Resources Planning Board, as was the case with other agencies of the Government and of our economy as a whole, adapted its activities as rapidly to the needs of the ordinary government and of the superimposed defense and war government which



sprang up in response to war's alarms and the attacks upon our people.

### Planning for Emergencies

In view of these changes in national organization and purpose, the National Resources Planning Board has continued its regular activities and has adjusted itself to the new objectives of the nation.

It is important and useful to emphasize the special requirements of emergency planning.

Time is the essence of the contract in an emergency, and, hence, many decisions must necessarily be made without mature consideration of all the relevant facts. There is little or no time available to look backward for trends, or to look around for interrelations, or to look forward toward anticipated developments of a somewhat orderly nature. The planning of a city may proceed in a more leisurely fashion than planning an all-out mobilization and production campaign. It is, of course, true that byproducts of defense and war activities may be various researches and discoveries—as in medicine, mechanics, chemistry, and organization, where many new applications of knowledge are made in a period of stress—and also the acquisition of new knowledge. When the occasion permits in war, there will be elaborate data collection and a long look ahead, but basic changes fundamental to planning may be made on short notice at times when energetic action is urgently necessary to the nation's life.

Important modifications of the structure and functions of the national economy made under the stress of war are avowedly temporary in nature. It is relatively easy to obtain their acceptance during a limited period of national sacrifice for a limited purpose. In long-time planning it is assumed that the changes indicated will be more permanent in nature, without, of course, being regarded as finalities.

It would be a grievous error to conclude, however, that no basic permanent planning is done during an emergency—war, depression, or otherwise. War, pestilence, famine, fire, flood, and earthquakes can and do make changes which fundamentally affect the welfare of the political society concerned. Dislocation of occupations, relocations of industry, transfers of labor, changes in taxation, wages, and profits, shifts in prices, and new developments in national trade relations, are factors, among many others, which may very materially modify the whole pattern of living—to say nothing of losses or gains in population, territory, and resources, both material and human. The future of France, of Germany, of England, or of America may be made or unmade in the course of crisis operations which are of profound significance to the life and growth of the nation.

A national planning board dealing for some years with the Nation's resources is itself a national resource to be utilized in the grand process of mobilizing all the Nation's resources for effective emergency action. Data already assembled is available to the responsible makers of national decisions; the experience of those who have observed the national resources and their trends and possibilities is valuable; and assistance can be given to fuller mobilization of emergency resources and more effective production. On the other hand, intimate observation of emergency actions and their effect on the national economy will be of very great value to long-time planning in a forward look to the period beyond the crisis—both the more immediate post-emergency transition and the farther removed period of stabilization.

Planning is an indispensable emergency necessity. The highest political art consists in the most skillful combination of the spearhead drive, the general strategy, military and economic, and the broad patterns of basic development of national resources and general welfare.

Since 1933 the Board has brought together and analyzed great masses of data regarding many important aspects of our national life—population, technological trends, research, land, water, energy resources, mineral resources, public works, urbanism, regionalism, long-time relief policies, industrial trends, the structure of the American economy—and has served as a clearing house for other data collected by city planning boards and by county, State, and regional agencies, all of which has been available to the planners for defense and war in various ways.

The government and the people of the United States are determined that successful prosecution of the war shall be translated finally into terms of permanent improvement of the general welfare of all, and it is the firm purpose of the Board to leave no stone unturned in outlining the organization of ways and means of making good this fixed purpose of the Nation.

At the end of the World War both in the United States and in Great Britain reconstruction commissions were either discussed or actually set up, but in neither case was an energetic effort made to carry through any considerable national program in the post-war period. In both countries there is now a firm determination that such a course shall not be followed again, and in both nations organized efforts are being made to deal with post-war problems.

The intimate contacts of the Board and its staff with the organization of the production process involved in the emergency program and the close insight into the nature of the industrial mobilization for war purposes are of very great value in planning for the period of national life following the emergency. It

should be easier to demobilize without great friction and distress, if we understand the steps by which full mobilization is being brought about. Just what happens to our national economy when in a defense and war period the national income goes up to \$100 or more billions, has an important bearing on the maintenance of full use of our national powers after the immediate emergency is over.

Collapse following the war would bring with it calamities as hard to bear as those of conflict. The general welfare which we seek to establish cannot be achieved and held by arms alone, but must be followed up by stabilization of national welfare on a high level. As President Hoover's Committee on Recent Social Trends pointedly asked, "Is it beyond the range of man's capacity some day to take the enhancement of social welfare as seriously as \* \* \* the winning of a war?" We are firmly convinced that depression need not follow the present emergency situation and resolved that it will not come if the Government is alert and active, and is supported by the joint efforts of our national forces.

To avoid any possible misunderstanding about the planning functions, we repeat what has often been said—that there is no magic, black or white, in the mere word "planning," except as it helps to realize

the national ideas and interests in sound and practical forms. Planning is an effort to make use of social intelligence in the shaping of basic policies, but plans have no life unless they meet with public approval and are shaped into policies by those responsible persons who are entrusted by the people with the power of decision.

But especially in this day of highly mechanized ways of life, it is necessary to look ahead and organize action in a world that moves at lightning speed. Even the clumsiest planning is better than drifting. It is better to bungle sometimes and fail than not to try at all, as any housekeeper, farmer, or industrialist can tell.

That a nation finds itself in a crisis is not a reason for ceasing to plan the use of its national resources, but, quite the contrary, is the occasion for more energetic use of planning intelligence than ever before, in many fields—industrial, governmental, both military and civilian, technical and scientific. Even the apostles of violence utilize planning techniques for their own purposes, and there is no reason why those who hold sounder ideas of liberty and justice should repudiate planning or look askance at types of planning which will contribute alike to winning the victory and its highest and best application to conditions of peace.

## NEW OBJECTIVES

We look forward to securing, through planning and cooperative action, a greater freedom for the American people. Great changes have come in our century with the industrial revolution, the rapid settlement of the continent, the development of technology, the acceleration of transportation and communication, the growth of modern capitalism, and the rise of the national state with its economic programs. Too few corresponding adjustments have been made in our provisions for human freedom. In spite of all these changes, that

great manifesto, the Bill of Rights, has stood unshaken 150 years. And now to the old freedoms we must add new freedoms and restate our objectives in modern terms.

Freedom of speech and expression, freedom to worship, freedom from want, and freedom from fear: These are the universals of human life.

Any new declaration of personal rights, any translation of freedom into modern terms applicable to the people of the United States, here and now must include:

1. The right to work, usefully and creatively through the productive years.
2. The right to fair pay, adequate to command the necessities and amenities of life in exchange for work, ideas, thrift, and other socially valuable service.
3. The right to adequate food, clothing, shelter, and medical care.
4. The right to security, with freedom from fear of old age, want, dependency, sickness, unemployment, and accident.
5. The right to live in a system of free enterprise, free from compulsory labor, irresponsible private power, arbitrary public authority, and unregulated monopolies.
6. The right to come and go, to speak or to be silent, free from the spyings of secret political police.
7. The right to equality before the law, with equal access to justice in fact.
8. The right to education, for work, for citizenship, and for personal growth and happiness; and
9. The right to rest, recreation, and adventure; the opportunity to enjoy life and take part in an advancing civilization.

These rights and opportunities we in the United States want for ourselves and for our children now and when this war is over. They go beyond the political forms and freedoms for which our ancestors fought and which they handed on to us, because we live in a new world in which the central problems arise from new pressures of power, production, and population, which our forefathers did not face.

Their problem was freedom and the production of wealth, the building of this continent with its farms, industries, transportation, and power; ours is freedom and the distribution of abundance, so that there may be

no unemployment while there are adequate resources and men ready to work and in need of food, clothing and shelter. It is to meet this new turn of events, that the new declaration of rights is demanded. But in formulating these new rights, we are not blind to the obligations which go with every right, obligations of the individual to use well his rights and to insist on the same rights for others, and obligations of the community to support and protect the institutions which make these rights actual. We believe that the American people are ready to assume these obligations and to take the private and the public action they impose.

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## **PART I**

### **PLANNING—WAR - TIME AND POST - WAR**

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Some of the principal objectives and problems in the field of post-war planning are presented by the Board in this part of the report, as well as the story of the Board's activities in relation to certain specific projects carried on in connection with the Government's war-time program.

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## PART I. PLANNING—WAR-TIME AND POST-WAR

### 1. PLANNING IN WAR-TIME

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Singleness of purpose, now concentrated on winning the war, has demonstrated that we Americans can organize our resources and that the American genius for and interest in planning is still effective. There is more planning effort now than ever before in our national history. As a nation we are demonstrating that we can mobilize for war, substantially increase the national income, approach full employment, and enormously increase our effective use of vast natural and man-made resources.

The National Resources Planning Board is aiding in various phases of the war effort where the special knowledge of the members and staff, or the "clearing house" activities of the organization can be of service. The Board's primary concern is with those actions taken now which will have an important influence on longer-range developments.

Immediately upon the outbreak of the war in Europe, the Board held an emergency session, September 1939, dealing with the new program of defense action, and urged upon all its staff and committees the immediate consideration of the new phases of national planning for defense production. The Board has been able to make its resources available to those in responsible charge of the new program. Some of the current activities of the Board which are most useful, include:

1. *The National Roster of Scientific and Specialized Personnel*, which is operated as a joint project with the Civil Service Commission. The purpose of the Roster is to facilitate the mobilization and recruitment of specialists for war and defense activities and at the same time to safeguard research and teaching from unnecessary interference so as to provide for needed defense research and for a continued flow of new personnel into these special fields. The project is under the guidance of Dr. Leonard Carmichael, President of Tufts College, and a group of advisers designated by various research and scientific councils. The Roster has been developed rapidly through questionnaires circulated to professional societies and directly from the office established at the Civil Service Commission. Already it contains classification of over 500,000 specialists, and calls upon the Roster for names of persons classified for war work have grown continuously since the work was started. Over 60,000 names of such specialists have been certified from the Roster to defense agencies. Part of a report on the first year's work of the Roster appears in Part III of this report.

2. *Industrial Location*.—New war industries and the enormous expansion of plant in the defense and war programs have raised numerous questions as to the wise location of these plants. The President requested the Board to bring together materials which would aid in the wise location of these industries and develop criteria for the selection of specific sites. A member of the Board's staff sits as an observer with the Plant Site Committee in the Office of Production Management and through this advisory relationship to the committee provides comments and materials on specific projects to those making the decisions. At appropriate intervals, maps and tables showing the progress in the location of new industrial plant capacity have been drawn together for the information of the President.

At the same time that the staff is advising as to immediate actions, a long-range study of the problems involved has been under way with particular reference to the strategic points when and where forces determining industrial location can be influenced. A report on these problems is being prepared for publication, and a summary is contained in Part III of this statement.

In the regional offices of the Board and in cooperation with State planning agencies, companion studies are being undertaken on the distinctive regional problems involved in location. Each of the regional offices of the Board has some special staff or consulting service at work on this undertaking.

3. *Transportation*.—Materials from the Board's major study of Transportation Policy have proven useful to various defense agencies dealing with the pressing problems of transport during the Emergency. The Board's earlier investigations of needed rolling stock and locomotives have been followed up and the results made available to appropriate officials. Data collected on pipe lines, tankers, and tank cars were helpful in the discussions of an "oil shortage" in the summer and autumn. A summary of war and post-war transportation planning problems and possibilities appears in Part III of this report.

4. *Community Problems Arising Out of Federal Defense Activities*.—To aid in solving these problems, the Board has assigned, through State planning boards, technical consultants to work with local defense and planning bodies. The consultants assist in getting "stop-gap" zoning and platting regulations adopted, in preparing plans for community development which will contribute to the future welfare of the community, and in adjusting

new housing and other facilities to both the emergency and long-range development of the area.

As a result of the reports submitted from the field offices of the Board and through negotiations with the Bureau of the Budget, the former Division of State and Local Cooperation of the Defense Commission, and the Office of the Coordinator of Health, Welfare, Recreation, Nutrition and Related Activities, the Congress appropriated \$150,000,000 for community facilities in defense areas where the lack of such facilities was impeding defense.

The Board's consultants and field office staffs have provided information and advice on the relation of Defense Public Works Projects to community plans in efforts to assist the Federal Works Agency in the selection of the most needed projects.

Through a similar arrangement with the Office of the Defense Housing Coordinator, proposals for defense housing are reviewed by the Board's field staff for quick comment on relation to city and town plans.

At the instigation of the joint Army and Navy Committee on Welfare and Recreation, members of the Board's staff have cooperated in efforts to provide adequate building, sanitary zoning, and platting regulations in the vicinity of Army cantonments and defense industries. Suggested forms and notes for the preparation of legislation on planning and zoning have been prepared by consultants of the Board and circulated to interested State agencies by the Board, the Department of Justice, and the Council of State Governments.

In cooperation with the Coordinator of Health, Welfare, etc., the regional representatives of that office and the regional officers and consultants of the Board are developing joint reports on social, economic, and physical planning problems in critical defense areas. These summaries serve as a basis for advice on proposed defense housing projects or public works as well as for beginning of community development plans.

5. *Conservation of Cultural Resources.*—The Board has set up a committee on this subject, at the suggestion of its Science Committee. The protection of the cultural treasures of the Nation in wartime involves plans for bombshelters or other protection for books, records, works of art, and buildings which must remain accessible or cannot be moved, as well as moving, packing, and safeguarding treasures which can be transferred to safe places. What things should be protected and to what degree? How do we move treasures without

too great risk? These and similar questions are under active investigation.

6. *Supply Priorities and Allocations Board.*—Members of the Board's staff have been drawn into advisory positions to the Supply Priorities and Allocations Board, under the chairmanship of the Vice President in order to make available all the relevant data and advice on national resources in the possession of the Board. As the Executive Director of SPAB declared, "This is a two-way street. We want to utilize all the material the Board has and at the same time to make available to the Board for future uses the materials now being collected in the course of the defense movement."

7. *Board for Economic Warfare.*—With this defense unit, also under the chairmanship of the Vice President, the same policy has been pursued. Members of the Board and a staff official have been designated for liaison purposes with this agency. Important studies have been turned over to the Board for Economic Warfare and particular tasks undertaken for or with their staff. Other types of cooperation are in process of development. This is of special importance in view of the inevitably close relationship between economic warfare in the international field and the development of national planning internally.

8. *Public Construction Trends.*—The Board is required by law to report from time to time to the President on the trends of construction. To assist coordination of construction activities, a bulletin of Federal Construction Projects is issued at frequent intervals. Summary maps and charts recording the progress of defense public works have been prepared for submission to the President.

9. *Economic Reporting.*—One of the regular activities of the National Resources Planning Board is the quarterly reporting on trends in national income, employment, and consumption. These statements, prepared by the direction of the Congress in the Federal Employment Stabilization Act, have a direct bearing on a variety of aspects of the defense and war plans. They record the rise in the national income, increases in the cost of living, national and regional employment figures, etc., drawn together from a variety of Government and private sources for the confidential information of the President.

An annual summary of these statements and of current trends comprises Appendix A of this report.

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## PART I

### 2. AFTER VICTORY—WHAT?

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Our national objectives have been described as the "Four Freedoms," "The Atlantic Charter," "A New Bill of Rights." The responsibilities of the National Resources Planning Board for post-war planning to reach these objectives lie in the domestic area. Other agencies, such as the Board for Economic Warfare and the Department of State, are responsible for post-war plans in the international scene. The closest cooperation among all the groups concerned has been arranged through frequent conferences and interchange of staffs, data, and proposals.

In November 1940 the President requested the National Resources Planning Board to undertake a study of what was then called post-defense planning. Later (January 4, 1941) the President wrote "I am glad to know that the Board is proceeding with the development of plans and proposals for the post-defense period. These plans will, of course, involve many Federal agencies and cooperation with State and local governments and private citizens, and I hope all executive agencies of the Government will assist you in correlating proposals for my consideration."

The Board has struggled with the task of post-war planning, emphasizing the need for such plans, in clearing the plans of the various agencies and interests concerned, in sketching the broad lines of approach to the problem, and in implementing the ways and means of dealing with the whole situation. In addition to the regular staff of the Board, specialists and consultants have been called in to aid the Board on post-war problems.

In this work, the Board recognizes the principle recently stated by Gov. Leverett Saltonstall, of Massachusetts, who, on appointing a Post-Defense Stabilization Board for his State, said, "Although the most pressing job at present is speeding up production of defense materials and strengthening our armed forces, it is imperative to begin planning for the tremendous economic and social readjustments which must be made after the war. Knowledge that careful plans are being laid for the future will have an important bearing on defense work itself because there is nothing like confidence of security for strengthening morale, and thus giving renewed energy to war-time production."

In a pamphlet recently issued by the Board, "After Defense—What?", three purposes of After Victory Planning were emphasized—"Full Employment," "Security," and "Upbuilding America."

**Full Employment.**—We shall soon have full use of our resources—material and human—to win the war. We will need full use to win the peace. Our people do not intend to let an economic depression, unemployment, and "scarcity in the midst of plenty" ever again threaten our growing standard of living or our economic security. If the victorious democracies muddle through another decade of economic frustration and mass unemployment, we may expect social disintegration and, sooner or later, another international conflagration. A positive program of post-war economic expansion and full employment, boldly conceived and vigorously pursued, is imperative. Democracies, if they are going to lead the world out of chaos and insecurity, must first and foremost offer their people opportunity, employment, and a rising standard of living.

**Security.**—Besides the opportunity to work and to have a just share in the products of our labors, we Americans want and expect as one of the Four Freedoms—"Freedom from Fear"—fear of dependence in old age, fear of unemployment, sickness, and disability.

**Upbuilding America.**—The President says that, "We Americans \* \* \* are builders." We know we can make our land more efficient, more livable, more beautiful. We propose to do so.

#### Preliminary Objectives

In accordance with the needs and the decisions the American people have already made concerning the maintenance and extension of personal freedom, security, and opportunity, the central objectives of our post-war planning may be summarized as follows:

**One.** We must plan for full employment, for maintaining the national income at 100 billion dollars a year, at least, a point which we shall soon reach, rather than to let it slip back to 80, or 70, or 60 billion dollars again. In other words, we shall plan to balance our national production-consumption budget at a high level with full employment, not at a low level with mass unemployment.

**Two.** We must plan to do this without requiring work from youth who should be in school, the aged who should be relieved if they wish it, women who choose to make their contribution in the home, and without asking anyone to work regularly in mines, factories, transportation, or offices more than 40 hours a week or 50 weeks a year, or to sacrifice the wage standards which have been set.



**Three.** We must plan to decentralize post-emergency activities as far as possible; to use to the utmost our system of modified free enterprise with its voluntary employment, its special reward for effort, imagination, and improvement, its elasticity and competition; and to advance cooperatively under national and governmental leadership.

**Four.** We must plan to enable every human being within our boundaries to realize progressively the promise of American life in food, shelter, clothing, medical care, education, work, rest, home life, opportunity to advance, adventure, and the basic freedoms.

**Five.** We must plan to make Up-Building America the keynote of the post-war program, including both development of our national resources adding to the National Estate, and service activities, which will increase the vitality, health, skill, productivity, knowledge, and happiness of the American people, and thus together end unemployment and add to our wealth and well-being.

\* \* \*

Our greatest resource is men at work, a resource which is lost forever when men are idle. Full employment is, therefore, the key to national prosperity as well as individual welfare in the modern world of power, machinery, labor specialization, and technology. In this world of growing economic interdependence, the individual can produce little working alone. Thus, step by step, men are experimenting with cooperative mass action to assure full employment.

The full employment we Americans seek must be, at the same time, free employment, unless we are to accept a new kind of economic slavery and lose those freedoms without which no material prosperity is worth the price to those who cherish freedom and the dignity of man.

In this time of crisis, when we are fighting to defend our freedoms and our rights, our way of life, and our scale of values, we must not fail to take stock of the problem of full employment which we shall face again, when this world war is over, and we can turn once more from war to peace, confident of our national security.

With total war we are building up our production to unprecedented heights. Already we have more men and women at work, more wheels turning, more power being used, more freight moving, more shipways filled, more goods being turned out, more workers in training and getting jobs, more commodities being purchased than ever before in our national history. In spite of awkward blockages here and there arising from the hasty and unbalanced character of this advance, we shall go on along these same lines, building up our total production until the Axis collapses and the threat of aggression against us is ended.

Within 2 to 3 years, every available person will be at

work, and we shall be producing all that we are capable of with the population, machinery, and technology then at hand.

The workers of the United States can produce, under a system of full employment, 105 to 110 billion dollars worth of goods and services once we are organized for it. In other words, a national income of 105 billion dollars is perfectly possible. When we organize for maximum production on the basis of full employment, without being stopped by the costs, we discover, as have other nations, that increased production pays the real costs involved. Doing the job pays the bill. In other words, the central problem is not money, it is manpower, resources, and organization. At last we are beginning to see that finance was made for man, and not man for finance.

A modern nation cannot avoid balancing its total production-consumption budget. This can be done at a low level with a great deal of unemployment, inefficiency, and suffering; or it can be done at a high level, with full employment, high efficiency, and a better life for all.

The full employment and prosperity which is coming with the war effort proves that we can have a full employment system and balance the production-consumption budget at a high level if we are determined to have it so, because we do have the necessary manpower, resources, productive plant, and organizing ability.

Everywhere one hears it said that, when this war is over, all countries, including our own, will be impoverished. This view, however, is not sustained by past experience. No country need be impoverished if its productive resources (both capital and human) are intact. The productive resources of this country will be on a considerably higher plane when this war is over than ever before. A larger proportion of our population will be trained to perform skilled and semi-skilled jobs. We shall have enormous productive capacities in all the machine industries. And in special consumers' durable industries, where plant and equipment may have become deficient by reason of the war, we shall be able very quickly, with our large basic machine-producing industries, to expand to meet the peacetime requirements. We shall have, when the war is over, the technical equipment, the trained and efficient labor, and the natural resources required to produce a substantially higher real income for civilian needs than any ever achieved before in our history. Whether or not we shall, in fact, achieve that level of income will depend upon our intelligence and capacity for cooperative action.

Some are hoping for a post-war boom. We got that after the first World War. Not improbably we may get it again. If the war lasts several years, we may

have at the end of the war sufficient accumulated shortages in residential housing, in durable consumers' goods such as automobiles, and in the plant and equipment required to supply peacetime-consumption demands, to give us a vigorous private investment boom. Indeed we need to be on the alert to prevent a possible post-war inflation. If in fact we do experience a strong post-war boom, there is, however, the gravest danger that it will lull us to sleep. Sooner or later such a boom will end in a depression unless we are prepared. If appropriate action is taken there is no necessity for a post-war collapse.

We have to make up our minds as a Nation that we will not permit a post-war depression to overwhelm us. We do not have to take economic defeat after the military victory is won. We *can*, if we will, maintain business prosperity. We *can* sustain a continuing demand for goods. We *can* keep industry going at high levels. We *can* maintain substantially full employment. We *can* achieve a society in which everyone capable of and willing to work can find an opportunity to earn a living, to make his contribution, to play his part as a citizen of a progressive, democratic country.

An important gain will, we may hope, be won from the victory program in the struggle to achieve and to maintain full employment. We have every reason to expect the national income to rise to around \$100 billions, in terms of 1940 dollars. It will be much easier to muster support for a program to resist a decline from a high income level than it has been in recent years to win approval for an adequate program to raise income to full employment from a low level. But we must be vigilant lest this gain slip from our grasp. Otherwise, we will have to make the old uphill fight all over again. We must deliberately set out to hold the new income level and to push it higher as rapidly as increasing productivity will permit.

The great problem we face when the war ends is to move over from a system of full employment for war to a system of full employment for peace, without going through a low-employment slump.

Of course, it will take time to get the new peacetime businesses going, to retool the plants, hire and retrain the workers, expand the factories, and get things moving efficiently along new lines. The time required for the switch-back will not be so long, however, as the time required now for the switch-over, if we may judge by world experience after the last war.

In the meantime, if things are left to work themselves out, what happens to the demobilized workers and veterans and their families? Will they be without work? Will they stop producing? Will the national income drop 15 billion dollars or so as soon as pent-up demands are met? Will the succeeding drop in consumption throw others out of work, and reduce national

production and income another 10 to 20 billion dollars? If so, we shall be back again in the valley of the depression, and a terrific new strain will be thrown on our whole system of political, social, and economic life.

The American people will never stand for this. Sooner or later they will step in and refuse to let matters "work themselves out."

The workers and farmers of America, the business leaders of America, the public officials of America know that the problem we face when the war ends is too big and complicated to be solved by the workers, the farmers, businessmen, or the Government working alone or independently. Nothing less than energetic and intelligent teamwork will make it possible for us to move over from war to peace while maintaining full employment.

In this program Government must take a leading part because it is the only representative of us all, the common meeting ground of all interests, and the one center of responsible coordinating power through which we can all act together.

We do not want the Government to run the whole show. We do not want a totalitarian state. We want freedom of enterprise. We want freedom for collective bargaining between employers and employees. We want freedom for cooperative action. We want freedom of choice of occupation.

If purchasing power is maintained at a high level, we need have no fears that private manufacturers, retailers, wholesalers, and farmers will not come forward and supply the market with the goods demanded by the public—a rich variety of goods at reasonable prices. Private business can and will do the job of production, but it is the responsibility of Government to insure a sustained demand. The ever-increasing gigantic powers of production of the modern industrial system, far exceeding that of any earlier experience in history, mean that an enormous output has to be reached before full employment is approached. Private industry and Government together must act to maintain and increase output and income sufficiently to provide reasonably full employment.

### Planning Lines of Action

The National Resources Planning Board has been instructed by the President (November 12, 1940) to collect, analyze, and collate constructive plans for significant public and private action in the post-war period insofar as these have to do with the natural and human resources of the Nation. In the discharge of this responsibility the Board will serve as a clearing house to gather ideas and plans, to stimulate appropriate independent action by other public and private agencies, to bring together individuals who are interested in harmonizing their views, and to furnish the

President and the Congress with information and assistance on the formulation of policies on these matters.

The elected representatives of the people will, of course, make the decisions on policies and methods for meeting the problems of the post-war period. The Congress has already provided appropriations for the inauguration of needed studies by this Board and for the preparation of post-war plans by various other agencies in the Executive branch. With full public discussion and appraisal, the Congress will determine the appropriate policies and how they shall be put into action.

From the statement of objectives in the preceding section, the lines of action to be explored and developed as elements of a post-war program are clear. They include:

1. Plans for Demobilization:
  - a. For men, jobs, re-training, and dismissal wages.
  - b. For machines—retooling and conversion.
  - c. For controls—maintenance as long as needed.
2. Plans with private enterprise:
  - a. Encouraging initiative:
    - (1) Production.
    - (2) Services.
  - b. Consumer Market analysis.
  - c. Industrial Location and Plant Conversion.
  - d. Government aids and cooperation.
3. Plans for Public Activities:
  - a. Improvements and Facilities.
  - b. Services.
4. Plans for Security—old age, unemployment, public assistance, family allowances, and special aids.
5. Plans affecting Labor Force.
6. Plans for Financing and Fiscal Policies.
7. Plans for State, City, and Regional Participation.
8. Plans in the International Scene—with particular reference to their domestic implications.

These items are summarized in the following paragraphs with indication of some of the agencies already at work. More extended statements will be found in "Part II" of this report "Public Works Planning" and in "Part III—Functional Development Policies and Programs."

Post-war planning is long-range planning to meet the future social and economic needs of the United States. In consequence, all parts of the Board's regular organization are participating in the work that needs to be done. Where necessary, new sections and new personnel have been added to round out the Board's planning activities.

No matter what the nature of its activity, it is the established policy of the National Resources Planning Board to carry on its work in cooperation with Federal

and other agencies having operating responsibilities. The Board will not attempt to make plans for other agencies within their field of independent responsibility. Rather, it will seek, as in the past, to persuade other agencies to prepare plans. The Board is instructed to gather these programs on behalf of the President. The Board needs and requests help and cooperation of official and unofficial agencies and bodies in assembling the plans for dealing with the needs of the post-defense period.

In fields where no formal interdepartmental committee has been established, the staff of the Board maintains close relations with all interested agencies. Wherever possible, major studies are performed directly by the appropriate agency rather than by the Board's own staff. In addition to the cooperative relations existing in specific fields of interest, the Board and its staff is keeping in close touch with post-war planning work throughout the Government and by private agencies.

#### 1. Plans for Demobilization

##### *Men:*

The demobilization of the armed forces of the Nation must be as carefully planned as their recruitment. The Selective Service Act of 1940 directed that arrangements be made for the return to previous employment of all men called for service with the armed forces of the government. A Reemployment Division in the Selective Service System directs the work of Reemployment Committees in various localities who cooperate in replacing selectees released from service. This division is interested in planning for the future demobilization of the armed forces and also in studying potential employment demands in the post-war period.

Much more thought should be given to the problem of the timing of demobilization than has been hitherto thought necessary. The defense and war programs have involved tremendous efforts to develop new skills and trained personnel for a great variety of industrial activities. The same procedures might be adapted to preparing men, while still in the armed forces, to assume jobs in industry when they are released from the Army or Navy.

Studies are being made by the Bureau of Labor Statistics of demobilization experience after November 11, 1918; of trends in productivity per man-hour, and of the size, age, and composition of the labor force. Data collected by the Bureau on labor force requirements for various kinds of work will be useful in projecting training and vocational needs in the post-war economy. Perhaps the idea of a "dismissal wage or allowance" for those employed in industry is also applicable to demobilized men from the armed forces.

*Machines:*

This time it is questionable whether we should be in such haste. Our total war effort now will bulk much larger in the national economy than it did in 1918. Any hasty curtailment of war production may have severe repercussions throughout our entire economy. Indeed, it is conceivable that it would be less wasteful to continue some war production even after the immediate demand is ended rather than to halt precipitately that production. If we are going to retrain men from the armed forces or from defense industries for peacetime jobs, we might appropriately consider retooling or converting our machines and plants to produce peacetime goods.

Not alone would the immediate worker in war industries thrown out of work be affected by hasty industrial demobilization, but transportation workers and the suppliers of raw materials for war production would also be affected. Their income would drop and hence their consumer demands be lessened. While we may want to give priority in the post-war period to consumer goods rather than defense goods, industrial demobilization might still proceed gradually.

The Bureau of Foreign and Domestic Commerce of the Department of Commerce is giving attention to distortions in productive activity occasioned by the war and defense programs and the possible transitional requirements in both consumer and producer goods. The possible extent of a "back-log" of consumer demand following the immediate cessation of the defense program is being examined.

*Controls:*

The mobilization of our resources has involved the establishment of Government controls over allocations of materials, prices, and priorities to meet war problems. The demobilization of our war effort and the shift from full employment for war to full employment in peace will involve some of the same kinds of problems. The adaptation of the Government controls to these ends must be planned ahead.

Plans can be laid now in order that we may have an orderly and economical procedure for demobilization. Even as the attention of a large number of Army officers and civilians should in peace time be given to the problems of war-time industrial mobilization, so in time of war production we must think about demobilization for peace-time production.

**2. Plans with Private Enterprise**

Private enterprise must be encouraged to think in terms of a high level economy. The industrial oppor-

tunities for tomorrow can be of unprecedented magnitude. Private industry must be prepared to participate in these opportunities.

*Consumer Market:*

The requirements of the war program in terms of battleships, airplanes, tanks, and guns are relatively simple when compared to the multifarious demands of the American consumer in peace times. But some gage of that demand can be discovered to assist those who seek to gear production to a peace-time market.

The Board has built up a fund of knowledge concerning the habits of the American consumer<sup>1</sup> and is now engaged, with the cooperation of various Federal agencies, in a re-examination of those data and its meaning in terms of various levels of national income or different distribution of income. The 1935-36 figures reflect consumer demands with a national income around 60 billions a year. What changes should be expected with a national income of 100 billion or 110 billion? If the lowest income group—the third of the Nation with incomes under \$780 a year—were to receive twice that amount, what kinds of changes in consumer demand should be anticipated? These questions and a long series of similar variations are being explored by the Board in the hope that such data will indicate the required needs in raw materials, productive plant, energy resources, transport facilities, and labor force. We shall have to estimate the needed additions to private capital plant to meet consumer demands and the levels of national investment required to meet general public needs and to insure full employment.<sup>2</sup>

The Bureau of Labor Statistics is making consumer spending studies through sampling techniques as a means of obtaining current data reflecting trends in consumer purchases as well as effects of the defense and war programs. These studies indicate potential demands for all kinds of goods when priority restrictions are removed. Similar studies in rural areas are being made by the Bureau of Home Economics and the Bureau of Agriculture Economics in the Department of Agriculture.

It would be appropriate if the tentative beginnings made by the Bureau of Foreign and Domestic Commerce in studying the volume of private investment in productive plant could be expanded, in cooperation with the Department's Business Advisory Council, to aid

<sup>1</sup> Reports issued by the Board relative to this subject include: *Consumer Incomes in the United States*, August 1938. *Consumer Expenditures in the United States*, 1939. *The Consumer Spends His Income* (pamphlet digest) June 1939. *Family Expenditures in the United States*, 1941.

<sup>2</sup> The validity of this approach to consumer market opportunities is buttressed by statistical analyses undertaken by the Economic Adviser to the Secretary of Agriculture.

private enterprise in the formulation of long-range budgets of capital plant expansion to meet expanded consumer needs and help maintain a high output peacetime economy.

### *Industrial Location:*

A major change in the distribution of industry may result from the location of new war industries. At the request of the President the Board set up a special staff to study problems of industrial location and to assist the Plant Site Board and other agencies making decisions on these matters with information and advice. The progress of that work is reviewed in another part of this report (Sec. 1, Part III) and shows that the long-range influence of new defense plants will largely depend on the adaptability of plant, machines, and industrial leaders to the market opportunities of the post-war era. If regional leadership has the qualities necessary to chart a course for regional development the plant and skills established now in new industrial areas provide a basis for new growth.

The energies of the staff of the Industrial Section of the Board are now concentrated on conversion problems and possibilities, but everyone concerned, of course, recognizes that the enterprise of private businessmen and industrialists will have to provide the primary impetus to effective conversion of war industries to peacetime production.

### *Management:*

No national resource is more valuable than the quality of its manpower. High among the qualities which are essential for a great nation in the present era of mass production and in the future era of correspondingly high consumption is the ability and the skill to plan, to organize, and to coordinate men, power, and materials in the accomplishment of defined objectives. This is the function of management. Without it there can be no great enterprise, no great nation, no great people.

Management, thus understood, is a national resource. It is a resource which is not absent in our Nation as our history and institutions testify. Nonetheless no one can examine the facts without concluding that we have not in the past fully realized the importance of management skills and ability nor taken the most effective steps to discover, develop, or conserve this national resource. In developing broad national policies for the future, designed to make full use of our national resources, material and human, particular attention will be given to management as a vital national resource.

### *Rôle of Government:*

The role of Government in relation to the provision of these new demands on private enterprise will continue, of course, to be an important factor. Government actions have always played a major role in the development of industry and its stabilization. Hamilton's Plan for Manufactures, our patent system, the Homestead Law, the grants of public lands for the construction of the transcontinental railroads, our tariff policies, the "good roads" movement and its effect on the automobile industry—and most recently the work of the Defense Plant Corporation—these are all examples of Government assistance to the free enterprise system. New forms of assistance and cooperative action between Government and business will be needed in the post-war period.

### **3. Plans for Public Activities**

There are many opportunities for government—Federal, State, and local—to aid private business in major fields of activity and investment where only new laws, new procedures, and new funds can unlock the door. Public action must, of course, be planned to meet general public needs. But, those needs which are met by private enterprise reduce by just that amount the remaining load on government.

Some of the major possibilities of new activities in production and services are revised in Part III of this report. They include first:

#### *A. Improvements and Facilities:*

(a) *Urban Conservation and Development.*—Our obsolete terminal facilities for all modes of transportation—rail, water, highway, and air—need simplification, modernization, and reorganization. After the war we can rebuild our housing facilities and really get at the job of eradicating the slum and blighted area from our cities—great and small. A unit of the Board's staff is developing materials on needed steps in government procedures, metropolitan cooperation, land acquisition, etc., to implement new action programs, and in this work is building on the previous reports of the Board.<sup>3</sup> Procedures are now being worked out for the progressive planning of the many facilities which are required for modern urban living. (Sec. 7, Part III)

(b) *Rural Works and Land Use.*—In rural areas there are corresponding opportunities for new enterprise—conserving our soil, rebuilding and operating our forest

<sup>3</sup> "Our Cities," "Urban Government," "Urban Planning and Land Policies," "Housing—the Continuing Problem," "Federal Aids to Local Planning," and "Public Acquisition—Part II; Urban Lands."



resources, developing the range, and opening recreational developments. The Land Committee of the Board has developed statements of criteria to assist in the evaluation of public work proposals (Sec. 5, Part III). The Committee's staff is at work measuring the extent of changes in agricultural land use and acreage requirements in order to provide our population with an adequate nutritious diet.

The Secretary of Agriculture has created an Inter-bureau Coordinating Committee on Post-Defense Programs with representatives from various agencies within the Department of Agriculture. A subcommittee on agricultural-industrial relations is concerned with the influence of future industrial activity upon agricultural production and welfare. Another is studying the problems of maintenance of desired levels of income for agriculture in relation to high levels of domestic consumption and industrial use of farm products. Agriculture has a high stake in the Nation's program for industrial activity.

A second subcommittee within the Department of Agriculture is concerned with the development of a shelf of public works projects to meet the needs of rural areas. For one thing, increased attention will be given to the restoration and development of the physical resources upon which agriculture depends. Soil conservation, flood control, reforestation, and irrigation are all required phases of a program to enable the nation to pass on to future generations not a depleted but an enriched soil base. In the second place there is a need for many new and improved public facilities for people in rural areas—public schools, hospitals, and sanitation and recreational facilities. Third, much remains to be done in bringing electric power to the Nation's farms and in improving rural housing standards.

In addition to the Inter-Bureau Coordinating Committee in Washington, the Secretary of Agriculture has set up nine regional committees throughout the United States made up of representatives from various agencies of the department. These regional committees will carry on the same kind of work for the region as the Coordinating Committee for the Nation, and will serve as a link between Washington and state and local planning bodies.

(c) *Drainage Basin Development.*—The success of the Tennessee Valley Authority in building private business in the area which it serves, naturally suggests similar programs for other drainage basins to provide multiple purpose development of their resources. Such programs may provide a way of stimulating both the social and economic progress of large regions or areas in the United States. Many plans already exist for such development, but they need to be tied together and put in orderly programs if they are to be effectuated promptly upon the return of peace. Proposals for the prepara-

tion and integration of needed plans for irrigation, navigation, water power, flood control, recreational facilities, industrial cooling water, drainage, pollution abatement, and other water use and control developments are included in the statement of the Water Resources Committee (Sec. 6, Part III).

(d) *Transportation.*—We must not forget that the development and upbuilding of America has always been closely related to the provision of adequate transportation facilities. We have relied upon transportation as the key to our settlement of the West and to building the Nation more than on any other one factor. There is no reason to suppose that we cannot and should not continue to rely upon new major developments in the transportation field after the war to provide a main spring for other kinds of developmental work throughout the Nation.

The forthcoming report of the Board on National Transportation Policies provides a basis for further post-war transportation plans—some of which are suggested in the statement contained in Sec. 2, Part III of this report. New rail facilities—particularly terminals—new highways, new airways and airports, new shipping facilities, will all be required with new equipment and operating techniques fitted to the rapid advances in technology.

Many agencies in the Government are directly concerned with these post-war transportation plans. The Public Roads Administration is at work on inter-regional highway studies and other projects; the Interstate Commerce Commission has many responsibilities in the field. The United States Maritime Commission is planning to make various studies of the demobilization of emergency shipping construction and the possible place of the United States in international shipping in the post-war world.

(e) *Energy.*—The war is teaching us the importance of conservation and integrated use of our energy resources. Coal, oil, and water power are all parts of a single energizing force for our industries, for heating, for lighting, and for other uses. New sources of power may be harnessed by our scientists and inventors. We must plan now to make the most effective use of these resources as energizers of new activities in the post-war period (Sec. 4, Part III).

(f) *Programming Public Improvements.*—The timing of public activities to reduce the intensity of booms and depressions has long been advocated by economists. Congress adopted the policy in 1931 "to arrange the construction of public works as far as practicable in such manner as would assist in the stabilization of industry and employment through proper timing of such construction."

The President has stated repeatedly<sup>4</sup> that we must

<sup>4</sup> Budget Message of January 3, 1941, and Planning Message of March 17, 1941.

slow down on expenditures for development projects which are not related to defense in order that our full national energy can be concentrated on the war effort, but he has also pointed out that now is the time to prepare the plans so that the projects which are temporarily "put on the shelf" can be ready when our energies can again be used for the development of our national resources and of our standard of living.

The National Resources Planning Board is responsible under the law for bringing together the Six-Year Programs of Federal Agencies and the current record of those programs is reviewed in Part II of this report.

The Federal Works Agency has assumed responsibility for the direction of the Public Work Reserve, a WPA financed project, co-sponsored by the National Resources Planning Board. Its purpose is to develop programs of useful public work projects and public services planned by State and local governments.

To make these programs and projects useful and effective at short notice the Board last year put forward eight recommendations<sup>4</sup>—one of which has reached the point of action by the Congress. For the advance preparation of needed surveys and investigations, programs and comprehensive plans, engineering plans and specifications and legal studies, appropriations are needed under an amended form of the Employment Stabilization Act (H. R. 5638 and S. 1617).

### B. Service Activities

Service activities for the direct benefit and welfare of individual citizens must be expanded if we are to realize the standards of living and well-being that we desire and that our civilization makes possible.

(a) *Health, Nutrition, and Medical Care.*—Increasingly in the last few years the United States has come to realize that one of its greatest resources is a healthy people. The medical examination of young men for service in the armed forces has indicated that we have not been very provident in fostering that asset. In the first place, a healthy nation depends upon a proper diet of adequate nutritional standards. Because of the war emergency special efforts have been launched by the Office of Defense, Health, Welfare and Related Activities to inform everyone about dietary needs. The Surplus Marketing Administration has been broadening its efforts to bring nutritional foods to low-income and needy families. We must plan to insure that every person in the United States has the proper amount and kind of food.

Our advances in preventive medicine technique have already done much to eliminate the sources of infectious disease and to prevent the spread of contagious disease. The United States Public Health Service, in coopera-

tion with State and local government health departments, has led the way. Nonetheless, there remains much to be done to provide adequate health education and to bring about a more completely satisfactory preventive practice. Moreover, a number of recent inquiries under both public and private auspices have revealed that large portions of our population do not receive proper medical and dental care. We must plan to insure that every person in the United States receives the medical attention he requires in order to maintain health.

(b) *Education.*—The goal for our educational efforts must be the provision of training for every child and youth of the kinds best adapted to his abilities and in the amount calculated to develop his maximum usefulness to himself, his community, and society. We know that we are yet far short of reaching that goal. Educational opportunities are not equal in the United States but vary greatly between regions and even within States. And curricula have not always been adapted to the needs of the individual student. We expect our educational system to impart to all a sense of our cultural heritage and of responsibility for participation in our democratic society. In the second place, education should prepare the individual to take his proper place in productive effort. And either through the educational system or otherwise youth must be given an opportunity to participate in and contribute to social accomplishment. The future of our democracy depends in no small part upon the provision we make for training youth in the ways and needs of our society.

A unit of the Board's staff on youth and educational problems has been created to assist in the preparation of desirable plans in this part of the broad area of the social services. A group of inter-departmental representatives interested in youth problems is discussing common long-run goals. A statement of the problem in this field appears in Sec. 9, Part III of this report.

(c) *Recreation.*—Today our society accepts the 40-hour working week as the standard length of time for man's productive effort. During the war period this may have to be lengthened, although our present knowledge of fatigue indicates that short working days may often be more productive per worker than long ones. In the post-war period we shall doubtless return to the 40-hour workweek, and even look forward to the time when increasing production and technological improvements will make possible shorter hours. But this is not the only reason why we must be concerned about ample recreational facilities for man's leisure-time activities.

Recreation is essential to health. And we cannot expect youth to grow into useful, productive citizens of our society unless they have had satisfactory recreational opportunities. We must build new facilities, both within and near our great urban conglomerations.

<sup>4</sup> Development of Resources—Stabilization of Employment, January 1941.



Also, we must provide competent recreational leadership. We know today that recreation is a matter of more than park space and play equipment—it is participation in group enjoyment and group activity, development of handicrafts, and hobbies, community enterprises, dancing, organized athletic events, etc. The desire of all to enjoy and use natural locations of scenic beauty alone or in company must be recognized and satisfied. We have made a beginning, especially in recent years, toward achieving these ends. In the post-war period we shall have new opportunities to bring recreational facilities and services to all.

(d) *Other Service Activities* must also be planned. With increasing leisure and advancing standards of living there will unquestionably be greater demands for library services. Our modern civilization has already taken important steps toward making art, music, and the theatre a part of the life of all citizens, instead of a luxury for a few, as in past periods of man's history. We must promote the development of our artistic resources and their universal enjoyment. The use of our special skills in scientific and specialized investigation has already contributed notably to our technological advancement. Our hopes for an ever higher standard of living depend in no small part upon the continued support of scientific research and free inquiry.

#### 4. Plans for Security

Personal insecurity going hand in hand with an insecure and troubled world has led to war. In the peace we seek after the present hostilities, we must plan to give to the individual in society the sense of security he has formerly lacked. In recent years this country has taken important steps toward providing certain reassurances to persons unable by the force of circumstance to provide adequately for themselves. Compensation schemes for injury and death arising out of a man's occupation have been in force in nearly every State for a number of years. In the last few years we have added unemployment compensation, old age and survivor's insurance, and care for the blind, the handicapped, and dependent children. These schemes of social security need expansion and improvement.

We have had to recognize that unemployment arises from social and economic factors and not from an individual's own failings. Work relief, social insurance, general relief, and old-age assistance have been our answer to the challenge of dependency. Now we propose to plan our national activities so that they will require the maximum utilization of our most important resource of all—our man-power. If we do so, we may look forward to a minimum of dependency upon general public welfare measures. We wish to use all who are capable of and available for work in our national productive effort.

There will continue to be some unemployment. We shall not wish to stop the technological development capable of bringing us higher levels of output. The immediate labor displacement will have to be cared for until it can be reabsorbed elsewhere in our productive activity. There will be periods of movement from one kind of employment to another, and seasonal fluctuations in the level of employment. We must see to it that we have an adequate system of security for all persons affected by such changes.

Whether employed, partially employed, or unemployed, every family is in need of certain indispensable requirements of food, shelter, clothing, and other comforts. We shall be able to provide them in the post-war period. We must plan to do so.

The publication of the report of the Board's Committee on Long-Range Work and Relief Policies will provide a basis for the further development of welfare plans.

The Administrator of the Federal Security Agency in July 1941, appointed an intra-agency committee on long-range planning. This committee has begun the preparation of long term programs for the development of community services in the fields of education and youth welfare, health, nutrition, recreation, and public welfare. Much of the work in the preparation of these plans is done within constituent organizations of the Federal Security Agency and then cleared through the Agency.

A subcommittee within the Department of Agriculture is concerned with the adequate provision of welfare services to the rural population. Methods for raising the general standard of living of farm people are under consideration, as well as programs for providing adequate nutrition, education, and medical care.

#### 5. Plans Affecting Labor Force

We have suggested the types of measures necessary to a basic foundation for the standards of living of our people. Above those minima is the good life which is sought by all. If this objective is to be achieved we must give serious attention to the study of living and working conditions. What are proper working conditions? What are proper wage rates? What are sufficient working hours? How do we secure democratic participation of working people in deciding these important matters? How do we establish labor relations with management which will secure the public interest? How do we retain the advantages of competition and yet establish a degree of orderly relationship in the labor market? How do we plan for the flexibility which comes with workers moving from one neighborhood or community to another, and at the same time prevent the maladjustments of aimless wandering? How do we establish more adequate training so that

our younger workers can readily find their way into productive work? What types and skills of workers will be demanded in the post-war period? What changes will occur in the years ahead in the numbers and age composition of our population? What will our immigration policies be after the war? These are not new problems. We have legislation, and we have customs for dealing with them in part. But they continue to be important and must be answered with a degree of certainty if we are to move into the post-war world with confidence.

#### 6. Plans for Financing and Fiscal Policy

All this expansion of services and improvements means governmental expenditures. The notion that we cannot finance our own production is quite without foundation. Every cent expended, private and public, becomes income for members of our own society. Costs and income are just opposite sides of the same shield. We can afford as high a standard of living as we are able to produce. But we cannot afford to waste our resources of men and material. We cannot afford to use them inefficiently. We cannot afford idleness, the idleness of \$200 billions of income.

The public expenditures required to rebuild America, to provide needed social services, and to maintain full employment can be provided for out of the enormous income which the full utilization of our rich productive resources, material and human, makes possible. The costs of producing this income are merely payments to ourselves for the work done. There is not—there cannot be—any financing problem which is not manageable under a full employment income. From a \$100 billion income we can raise large tax revenues—large enough to service any level of debt likely to be reached and to cover all other governmental outlays—and still retain for private expenditures more than we had left in former years under a \$70 billion income with lower taxes. Taxes are merely one way of paying for social services and public improvement projects which we need. But it is not necessary or desirable under all circumstances to finance all public expenditures from taxes. Whether taxes should equal, fall short of, or exceed expenditures must be decided according to economic conditions.

For the study of these fiscal problems the Department of the Treasury has set up a special research unit to inquire into problems of duplicating tax sources among various levels of government. Possibilities of tax adjustments in the general government revenue scheme will be given attention. Also post-war demands upon fiscal policy are being studied. Similar work is being done cooperatively by the staff of the Board of Governors of the Federal Reserve System. Studies are also being made here of international trade and monetary questions.

#### 7. Plans for State, City and Regional Participation.

The opportunity in the post-war period to build a better America is an opportunity for every part of the country as well as for the nation as a whole. It calls for plans and action programs not only on the national level, but also by regions, States, communities, and by private citizens, local enterprises and professional groups. Each area can look ahead to participation in the national post-war effort previously outlined: new housing, power and rural electrification; expanded highway, railroad, and airport facilities; reclamation and conservation projects; new industries; and adequate educational, health, welfare, nutritional, recreation and cultural facilities and services. What post-war developments each area can undertake will depend on its needs and the ingenuity and foresight with which it utilizes its resources to provide for them.

For many years the State Planning Boards and numerous city and county planning agencies have inventoried the resources of their areas and studied the problems involved in their more effective use to increase living standards and provide full employment. A vast amount of research has also been done for specific areas by other governmental agencies, Federal, State, and local. Plans and action programs have been prepared by all these agencies. Correlation of available information and plans for the development of each part of the country with due regard to resources and manpower will produce a substantial backlog of post-war plans for upbuilding the nation.

The field offices of the National Resources Planning Board have prepared preliminary plans for regional development in the post-war period. Summaries of these plans are contained in the Board's forthcoming report "Regional Development Plans—1941." During the last year these programs have been reviewed, reworked, and expanded with the cooperation of State Planning Boards, regional planning commissions, special advisory groups, and with the active assistance of the field representatives of many Federal agencies. While they represent a synthesis of the data, plans and programs available in the region, they are approximations of plans, rather than full specifications, and will be filled in and improved in subsequent revisions as more detailed plans are prepared for the various parts of the region.

It is vital to democracy that planning for the development of local areas be done by the citizens of those areas and their governmental agencies. Only in this way can the upbuilding of America be successfully carried forward. Each city and county can best contribute to post-war reconstruction by starting now with the preparation of plans for the material development and service activities which are needed to make it a prosperous community. The National Resources Planning Board

therefore urges the appointment of official planning agencies or groups, where these do not exist, to undertake this task. Through regional and State planning agencies, and through the field offices of the Board, assistance can be had in relating local planning activities to State, regional, and national programs. Special advice can be obtained from various Federal and State agencies concerned with technical problems. It is hoped that each local area will prepare plans for post-war developments including: (1) reconstruction of blighted areas and new housing, (2) highways, airports, rail and bus terminal facilities, (3) industrial development, (4) conservation and improved use of land, and (5) health, educational and recreational facilities and services.

The following steps are suggested as aids in the preparation of these plans:

(a) *Summary of Available Data on Needs and Resources.*—A quick appraisal of the "sore spots" and problems of the area which contribute to a low standard of living will indicate where many improvements are necessary and desirable; while a summary of available resources, natural and human, and the extent of their use will provide a guide to what can be done.

(b) *Area Analysis.*—The National Resources Planning Board has recently experimented with a technique for rapid analysis of the problems of nonurban areas leading to recommendations for the developments required for employment stabilization. The results of this experiment are available for use by local planning agencies. Similar experimentation is now being undertaken on a procedure for progressive urban planning. It is believed that these techniques for area analysis will be of much assistance to planning agencies in the formulation of programs for post-war development.

(c) *Programming of Public Works.*—The President has requested that State and local governments prepare a "shelf" of public works and activities which can be called into action in the post-war period. To aid in this task the Board has conducted demonstration projects and developed a procedure for the preparation of 6-year programs of State and municipal public works. It now serves as joint sponsor with the Federal Works Agency of the "Public Work Reserve" which will provide technical guidance and assistance to State and local governments in the scheduling of their construction projects. Development plans prepared by State and local planning agencies should be the basis for the selection of the program of post-war construction projects.

(d) *Advance Preparation of Construction Plans and Estimates* is also needed if delays are to be avoided when release of our energies from the war effort makes possible renewed peacetime development. These and other related problems of "advance planning" for public works are discussed in Part II of this report.

## 8. Plans in the International Scene.

From this point on the American people will never again make the mistake of believing that we can have prosperity while the rest of the world collapses; or peace while the rest of the world is at war; or freedom while the rest of the world is being enslaved. It is therefore assumed that after the war we shall make our international policy and the international behavior of American private interests conform to our desires for peace and the elevation of human dignity everywhere.

Our foreign policy will have an important bearing upon our domestic employment program when peace returns. Through an extension of lend-lease we shall certainly help feed the starving peoples of Europe until they can again get on their feet. This will take all the food, shipping, trucks, and gasoline which we can muster, and will call for plans now for the organization of this unprecedented gift to humanity. There will be no time to lose when Hitler falls. Millions already are starving.

After Europe's needs for food, clothing, and emergency medical care have been met, the peoples of Europe will be able to rebuild their own civilization. Perhaps then our greatest opportunity to help others economically will be found in Asia and in parts of North and South America, working in cooperation with the peoples and the governments of those lands. In all international dealings, however, we will have to remember that selling can only be maintained in the long run by buying. Trade is a two-way street.

The Department of State and the Board for Economic Warfare are the agencies primarily concerned with international post-war economic collaboration. The Secretary of State has designated a Special Assistant to supervise the Department's interest in future international relations. In addition, an informal inter-departmental group is cooperating with the department. Work has been started on a study of international standards of living. The Board for Economic Warfare expects to undertake a survey of the world distribution of natural resources and to prepare plans for handling of American imports of raw materials. An International Economic Unit within the Bureau of Foreign and Domestic Commerce is studying the possible international effects of domestic economic post-war programs. The international balance of payments that would arise from a heavy United States draft upon world raw materials is being postulated. In the light of these possibilities the unit is examining the desirable conditions for a resumption of foreign lending.

These international problems are mentioned here not to dispose of the difficulties involved, but rather to accent the importance for all future planning of our international status.

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## PART II

### PUBLIC WORKS PLANNING

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Advance planning of public works is one of the Board's responsibilities under the Employment Stabilization Act of 1931. In carrying out this responsibility the Board maintains and annually revises the Six-Year Program of Federal Public Works required by the Act. In this part the situation with respect to public works in 1941 is reviewed, the progress in public works planning by the Federal agencies in different functional fields is reported, and the picture of non-federal public works programming is presented.

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## PART II—PUBLIC WORKS PLANNING

### 1. THE PUBLIC WORKS PLANNING PROBLEM IN 1941

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#### General

With the outbreak of war, on top of intensive defense preparations, the problem of public works planning in 1942 is drastically different from what it was as recently as a year ago. The short-term aspects of war and defense planning became paramount with the inauguration of special defense construction programs and the necessity for assigning priorities to materials of strategic importance to construction. The long-term aspects, particularly the potentialities of public works in a program of economic stabilization, have become of Nation-wide concern as the fear of post-war dislocations in industrial activity and employment is felt throughout the land.

In its early stages the defense program itself took the form of a public works program, through the construction of army camps and training centers, naval bases, and facilities and industrial plants to produce the materials of war. Almost immediately thereafter the need was recognized by the Lanham Act for providing proper living quarters for the millions of workers concentrating in the "defense areas," whereupon the Government embarked upon a large program of housing for defense and war workers. The passage of Title II of the Lanham Act providing for the construction of public works facilities in congested defense areas went further in establishing national defense as the prime objective for much of the public works to be undertaken during the immediate future.

The shift in the public works objectives from that of providing employment for those experiencing distress in a depressed economy to that of furthering the defense of the Nation is a change of major magnitude. It has required a correspondingly drastic change in the principles governing the administration of public works activity. It has demanded an entirely new set of criteria to govern decisions as to what projects are to be undertaken. Furthermore, such an objective has obviously tended to concentrate the construction so undertaken in those communities where war production or war activity is at its highest, which means those communities experiencing, at least temporarily, an abnormally high rate of growth. The provision of new housing and community facilities in such areas is a powerful instrument for good or evil, for those communities are most sensitive to the influence that the new facilities bring to bear. Through the new construction the communities can be guided toward development along

sound lines or fall into a type of growth which may bring disaster in the future. Planning for the program, if well done, can assure that those powerful forces now exerted with all the strength of the Nation behind them will yield their utmost in permanent community benefit. Planning, therefore, assumes grave and heavy responsibilities.

Quite aside from the considerations involved in planning of cantonments, housing and public facility projects in the defense areas, a powerful force has come to play upon the public works field as a whole during the past year. Shortages have developed in certain classes of materials and labor as a consequence of the demands made upon the Nation's economy by the war effort. These shortages make more imperative than ever before the necessity of doing first things first, of formulating and applying rational criteria for the selection of projects to be undertaken. The materials in which shortages have developed are also materials which are of strategic importance to many classes of public construction and, consequently, the administration of a priorities system by the national defense agencies is having a profound influence upon public works. Availability of men and materials rather than availability of funds is now the controlling factor. Budgetary considerations no longer present the final criteria as to what projects are to be undertaken. Projects may now be adequately financed and their advancement still be wholly dependent upon an assurance that their demands for construction materials does not disadvantage other and possibly more important phases of our national effort. The new situation clearly demands a systematic approach, the establishment of criteria capable of indicating the relative importance of public works proposals, one to another, and, moreover, to other needs for materials and labor, whether those needs arise from civilian demand or from war necessities.

The war and defense programs have exerted an equally profound influence upon the long-range aspects of public works planning. The rapid shift in the level of our industrial activity, from one of only partial utilization of our resources to one of strain and shortage, inevitably underscores the question of what may happen to employment and human welfare when the furious pace of armament slackens. After the war—what?

After planning to win the war the most important planning problem is that of avoiding an economic dislocation at the termination of the war. That task takes the form, in part, of planning a course of action that

will induce a continued high level of productivity, and, in part, of planning for the many elements that must be included in any program of economic security. In regard to public works, a vital phase of the problem is the determination of the role that is to be expected of it in the total plan.

### **Criteria for Public Works During the War Emergency**

The establishment of a general framework for priority ratings to be assigned to public works projects requires consideration of a number of general criteria or controlling principles. They have to do with war requirements, the social importance of the project, the character of the work and level of public service that is to be provided by the project. Four sets of criteria grow out of these principles, all of independent validity. They have nothing to do with how the projects are to be financed, or with the public or private character of the agency responsible for administration of construction. The projects themselves, and particularly the purposes they are designed to accomplish, are controlling.

**The first principle to be observed in choosing public works projects for prosecution during the war is that they should contribute as much as possible to the central objective of the national effort of winning the war.**

This means, obviously, that the projects which are of direct military, naval, or industrial importance must be accorded the highest rating. Furthermore, assuming that the strengths of all other considerations are equivalent, the provision of public facilities to serve directly such defense establishments as, for example, access roads, power lines, water lines, sewer lines, and the like, should take no more than second place. Third order of importance would be assigned to projects which serve with equal directness the community or area which is primarily engaged in defense activity, when those facilities are necessary for the war effort. Fourth order of importance would be assigned to the construction of new facilities to serve communities, areas, or activities only incidentally involved in war activity. These orders of importance have nothing to do with who pays the bill—private industry or local, State, or Federal Government. They are choices of need rather than of finance.

**A second principle is that in a time of shortage of labor and materials, the greatest possible use should be made of existing facilities.**

This would mean that maintenance and repair of existing public facilities would be given first preference; second, the completion of construction of projects already well under way; third, alterations, rehabilitation, adaptation, and the like, of existing facilities so as to serve the purpose at hand; and fourth, new construction

projects. The replacement of existing facilities by new ones of more modern type but of no greater capacity would have to take last place.

**Another principle that must be observed in any time of shortage, whether the shortage is attributable to the war or any other cause, is that a maximum of social benefits should be derived from the materials and labor to be devoted to public works projects.**

This means that only those projects yielding the more important social values should be undertaken. The expression of a scale of social values can never be wholly objective; but wide acceptance would probably be given to a scale which would put the protection of life and public health in top position, and include in an appropriate place the protection of property from natural catastrophe, the provision of adequate schooling, the facilitation of commerce, industry, and agriculture, the maintenance of law and order, the stimulation of sanitation and cleanliness, the provision of adequate shelter, conservation of natural resources, provision of facilities for recreation, and the relief of indigent distress. When the appropriate order of these items is agreed upon, it should be observed that the list is made up of purposes for, rather than types of, construction projects. In considering a group of projects, if all other considerations are of equal importance, the projects should be given preference in accordance with such a scale of social values.

**The fourth principle to be observed is that in a time of shortage the establishment of minimum standards of public service has a greater claim on available materials and labor than does the establishment of refinements or luxury levels of service.**

Applied to the public works field this principle would demand, for example, that a water purification plant having as its major purpose the assurance of bacterial purity would be given preference over a water softening plant; that harbor improvements at ports of entry would receive preference over harbor works to serve pleasure craft.

All four of the principles expressed above are of independent validity, but they must all be woven together in any workable scheme for appraising public works proposals. Furthermore, in such a time as this, public works projects compete for materials and labor with all other elements of the national effort. Consequently, not only must public works proposals be appraised relative to each other but they must be appraised relative to all other aspects of the national effort if the national well-being is to be served.

### **Criteria for a Post-War Public Works Program**

As the Board has already pointed out, the focus of our planning for the post-war period is full employ-



ment, and full utilization of our national resources. A broad program of building public works must be an important part of our plan. Through public works, underdeveloped areas of our country are stimulated toward greater productivity, commerce and industry are facilitated, life and property are made more secure in the city and on the farm, and metropolitan civilization is made possible. Through the process of building these public works, employment is created, industrial production is brought about, and the circulation of the income stream is aided. Our public works program will fill a vital role in the complete plan to keep our economy functioning at a high level, and in directing strengths and energies, at least equivalent to those now so necessarily directed toward winning the war, toward the uses of a world at peace.

The task of making our Nation the better land we intend it to be is an enormous one. Our cities are badly down at the heel and need rebuilding. Our transportation system requires modernization. Much of our population needs to be rehoused. Our polluted streams must be cleansed of their pollution. Our fertile lands must be saved from destruction. These are but a few of the things that need to be done, a few of the public works projects for which we must plan.

But a public works program is but one element in our total plan. There are other programs as well if we are to achieve our aim of maintaining high national income. We cannot expect a public works program to do it all. It must be accompanied by programs designed to call forth the maximum of effort by private industry, by programs of social insurance and programs of public assistance. All these programs must be properly related so that a satisfactory equilibrium is achieved in the high-income economy for which we plan. Our aim is an economy that will provide work for all those willing and able to work. We must provide the opportunity to produce to all those willing and able to produce. That is the meaning to be given to employment stabilization.

In our total plan, then, what role is to be assigned to our public works program? To achieve an answer we must inquire into the characteristics of such a program to determine the role for which it is best suited. For convenience of discussion and because of the different considerations applying to different types of public works, the problems of planning construction projects are presented first and followed with a discussion of nonstructural improvements.

#### Construction Projects

One great portion of a public works program will consist of construction undertakings, exemplified by the modernization of our highway system, the full development of our water resources through the

building of dams, power plants and channel works, new housing, the rebuilding of our cities, and similar projects.

Projects of this kind will vary in size from mammoth structures like Grand Coulee Dam to minor improvements such as the provision of curbs and gutters along city streets. They will be located in the heart of our greatest cities and in the least populated spots in the country. They will have purposes as varied as the purposes governments serve. They will fall within the administrative jurisdiction of the Federal Government, of State governments, of cities, counties, school districts, sanitation districts, and other public bodies. Some will require skills of high order, others will demand little more than manual labor from the workers employed. Some will consist primarily of fabricating into a completed structure many materials produced by manufacturers, while others will demand little in the way of such materials.

Construction has been a function of government for ages. It has always played a key role in the development of our Nation. It has expanded and contracted in scope, it has fallen and risen in volume throughout the years of our country's history, but a program of public construction we have always had. Planning for such a program in the post-war period, therefore, will be planning for its magnitude and character rather than planning whether it shall or shall not be. We can plan for an enlarged program or a program that would emphasize certain types of works. There will be public construction in the post-war period whether it forms part of our total plan or not.

The magnitude of the public construction program of the Nation has varied considerably over the past few decades, although the long-term trend has been strongly upward.<sup>1</sup> Before the Federal Government's measures of employment stimulation were introduced in 1933, the greatest peacetime program of all governments of the Nation was in 1930 when the combined total ran to approximately 2½ billion dollars. The least it has been during the past 20 years was in 1933 when it was a little more than 1½ billion dollars. It is currently estimated that its extent during 1942 will reach the highest point yet attained, perhaps near 9 billion dollars.

Moreover, public construction is considered to be a part of, and is closely identified with, the construction industry. That industry in 1927 produced plant and structure, public and private, valued at about 11 billion dollars and will probably produce more than that during the current year. Its lowest point, like the lowest point in public construction itself, was in 1933 when the total was less than 2½ billion dollars.

<sup>1</sup> See Part II, Sec. 3 of this report.



It has been remarked upon earlier that construction is a normal and well established activity of government, non-Federal as well as Federal. The significance of this is that there is, and will continue to be, a well established, highly decentralized administrative and operating organization through which such special efforts as should be decided upon can be directed. Every State and every city and county has a public works organization of some sort ready at hand to participate in the program. Thousands of construction organizations have had long experience in executing the program. Hundreds of thousands of workmen have public construction as their normal field of occupation and are adept in the skills that such occupation demands.

In brief, public construction is an established part of our governmental and economic fabric. Even during the war period this relationship between public works and government and the national economy will prevail. When that period comes to a close there will be workmen, construction organizations and administrative procedures with which to build. Coordination of organization, stimulation of activity and guidance of its direction will be called for, but we shall not be starting from scratch.

Moreover, the needs of public construction for materials makes heavy demands upon the products of industry. Steel, copper, timber, petroleum products, cement, brick, tile, glass, machinery—all these and many other industrial products are called for in huge quantities by a program of considerable magnitude. In fact, the industrial processes upon which such a program depends account for a larger share of the value of the final product than does the construction process itself. We can say, therefore, that just as there are many thousands of construction workmen normally identified with public construction and dependent upon it for their livelihood, there are even more thousands of industrial workers whose employment and income are attributable to the demands of public construction upon their productivity. The larger the program the greater the number of industrial workers called into partnership in the effort.

Another characteristic of such a program is that it quite naturally spreads itself widely over the Nation. A large part is ordinarily undertaken in our great cities, in the construction of the public buildings, the streets and boulevards, the water and sewer systems, and the housing developments that urban society depends upon so much. Another portion takes place in those inter-urban reaches through which run the highways of commerce. Even in the younger and underdeveloped areas of the country, the construction of developmental projects brings activity, through the construction of dams and reservoirs for irrigation, navigation, flood control and power, and of highways to knit the Nation together.

In the metropolis and in the village, in the heavily settled areas and in the wilderness, the program of public works carries out its function of building up the Nation.

Moreover, the spread of the activity generated by the program is not adequately disclosed by the geographic distribution of the construction projects themselves. The manufacture of the materials required ordinarily takes place at many other, perhaps distant, points. A bridge in Texas may mean employment in the steel mills in Gary, a water line in Virginia may support the job of foundrymen in Birmingham.

So far the characteristics that have been discussed have been those of the entire field of public construction. In addition, there are characteristics of great significance which are governed by project type or project size.

Program flexibility, or the responsiveness of the program to expansion or contraction control, is dependent upon the types and sizes of the projects of which it is composed. It has been clearly demonstrated that large projects, in general, are ponderous, both in being put under way and in being completed. They take long and careful preparation; early stages of construction may not be capable of rapid progress and the peak of the demand for labor may be relatively long after the project has been started. The construction period is long, generally, and may easily continue into a period of labor shortage. The smaller projects, conversely, get under way quickly, soon reach their peak of labor demands and are brought to completion in a relatively short time. A program made of wholly small projects, therefore, could be expanded or contracted rapidly by the simple process of starting a greater or smaller number of projects. On the other hand, a program made up wholly of the larger undertakings, although difficult to expand or contract would have a sustained demand for labor and materials.

Flexibility is also somewhat dependent upon the types of projects contained in the program. Some projects, whether large or small, are of such a nature that construction must be carried through to completion before any utility results from the project at all. For example, a bridge half done cannot be used at all, a water purification plant is of no use until it is completed. Projects of this unitary character must be finished, or the work that has been done is largely wasted. There are projects of another type, however, that are of a quite different nature. Highways, streets, water and sewer lines and the like can almost literally be built by the yard and, within close limits, whatever is completed is of use. Inclusion of projects of this type in the program contributes further to flexibility and responsiveness to control.

Public construction projects make demands for labor not only on the site of construction but also in the

industrial operations that produce the materials of construction. But the ratio of one to the other varies rather widely from project to project.

For example, studies of PWA construction by the Bureau of Labor Statistics indicate that street and road projects require 1.4 man-hours of employment away from the site of construction for every man-hour required on the construction itself. Steam power plant construction, on the other hand, shows a ratio of almost four to one. Between these two extremes it has been found that the ratios of other types of construction are about as follows: residential building, 1.5; reclamation dams and structures, 1.6; sewage disposal, 1.9; nonresidential building, 1.9; and water supply, 3.3.<sup>2</sup>

It seems clear that in our general strategy of maintaining the level of national income the public construction program should have, first, the role of creating the physical plant that a higher level of national life demands. In carrying out that function we can be assured that it will play an equally important part in supporting a high level of activity in certain vital sectors of our economy. It will effectively call forth the productivity of the blast furnace and the steel mill, the logger and the lumber mill, the cement plant, the quarry, the equipment manufacturers, the railroad, the construction worker and the construction organization. We can be assured that it will account for employment in proportion to the magnitude of the program we undertake. In calling forth that productivity and in accounting for that employment the post-war program can partly replace the demands now being made by the defense program itself.

Public construction can be of great strength in supporting many vital areas in our economy if we could be assured that it would not, in the national aggregate, fall below a given minimum volume. If, for example, we should adopt policies that would assure that at least 3 billion dollars of public construction value would be created annually we should know that we had secured the employment of at least that portion of our worker force that is normally attached to public construction activity. This might require that the financial strength of the Federal Government would have to buttress the strength of non-Federal public agencies, to make sure that there would be an appropriate amount of non-Federal public construction undertaken. But we should then know that the agencies of government would not themselves aggravate a period of underemployment by curtailing the level of their own construction activities. Such an effort would be, in effect, toward the stabilization of public construction itself, and that important part of our heavy industry's activity which is dependent upon it.

But, important as such an achievement would be, the field of public construction is capable of even greater contribution toward employment stabilization. Although it cannot be expected to hold out job opportunities for *all* who might not otherwise be employed, it can provide such opportunities for many. When total public construction aggregates more than about 3 billion dollars annually it begins to require the services of workers over and above those upon whom it normally depends. Through efforts designed to expand the more flexible portions of the public construction program, much can be done toward providing an opportunity to be productive to those willing and able to be productive. Expansion of this sort might be brought about by an increase in Federal budgetary expenditures, by an enlargement of the scope of Federal grants-in-aid or loans to non-Federal public agencies, through guarantees of non-Federal bonds, or through a combination of such measures. The employment that would result would be in proportion to the amount of construction work that would be induced.

A larger and more important aim would be the assurance that the construction industry as a whole, public and private, would be called upon to produce at least a certain minimum of value annually. An amount somewhere between 10 and 15 billion dollars seems to be indicated by experience. To achieve such a goal, not only would Federal financial strength have to be thrown behind State and city activity, but it might also have to be relied upon to provide inducements sufficient to call forth the necessary amount of private construction. The total construction volume would be made up of: (1) Federally undertaken construction; (2) construction undertaken by non-Federal public agencies with Federal financial support; (3) construction undertaken by non-Federal public agencies without Federal assistance; (4) private construction supported in part by Federal financial strength; and (5) private construction not aided by Federal financing. Through adjustments in its own budgetary expenditures, through grants, loans or loan guarantees to non-Federal governments and to non-governmental agencies, the Federal Government would seek to assure that the national total of construction would not fall below the figure that seemed most appropriate.

#### Project Objectives

There are at least three objectives that might be set for such a program of public construction in the post-war period. They are: (1) the physical development of the United States in order to bring it closer into accord with our national aspirations; (2) the stimulation and support of the Nation's economy through the material orders and wage payments that are occasioned by the construction process; (3) the pro-

<sup>2</sup> See *The Economic Effects of Public Works Expenditures, 1933-1938*, N. R. P. B. p. 54.

vision of opportunities for employment for those who would otherwise not be employed. These objectives are wholly complementary, rather than exclusive. A program of public construction can be made to achieve all three.

If national development is chosen as the principal objective, the other two goals are almost automatically won. However, the converse of this proposition is not necessarily true. A program could be planned that would require the employment of many people but it would not necessarily contribute greatly toward the development of the Nation, nor even provide any powerful stimulus to private industry. Also, a program might be planned to provide a maximum of industrial stimulation and still fall short of bringing about the best sort of national development.

The objective on which focus is sharpest, in both planning and operation will be of great influence in the determination of administrative policies. Too sharp a focus upon creating employment may lead to policies that will provide less than the maximum of industrial stimulation and less than the best national development. A sharp focus upon industrial stimulation may lead to policies not most conducive to best national development. It is upon national development, therefore, that the planning attention should first be focused. We can be assured that a program planned in such terms will yield its full quota of employment and of support to the other areas of our national economy.

#### Other Improvements

During the past 8 years considerable experience has been gained with public works programs of the sort that, although not yielding elaborate structures, contribute greatly toward the conservation of our resources. We refer to the sort of activity which has been carried out by various agency programs of soil erosion control, reforestation, etc., in rural areas and corresponding undertakings of grading parks and streets, filling in of low-lying areas, etc., in our cities. Such activities yield values of tremendous national importance. The fact that they also demand the services of a great many people make them highly appropriate for consideration in an employment program.

One of the outstanding characteristics of a program of activities of this kind is its high degree of flexibility. The extent to which work of this sort is carried on is very responsive to measures designed to bring about its expansion or contraction. No elaborate planning and preparatory work is necessary before projects can be put into execution, and they are not dominated by undertakings of unitary character. Most of them can almost literally be carried out by the acre, and whenever or wherever activity is discontinued, the work

that has been done approaches full utility. Moreover, such projects are not dependent upon the availability of trained workmen and are therefore well suited to giving employment to those who are not experienced in the arts of construction. A program of structural improvements is ideal for stop-and-go operation.

It is to be observed that such work is equally available in rural or urban sections of the country. The demands made by such a program upon the rest of the national economy, though requirements for materials and equipment are usually meager, nevertheless influence economic activity through putting purchasing power in the hands of the workers.

Out of these considerations there come a number of indications as to the part that can most appropriately be played by a program of nonstructural improvements in our post-war plan.

It should be relied upon heavily to take up the slack in the demand for labor, particularly those who are not skilled in construction or in industrial operations for which there will be demands. The program might vary in amount from small sums to as much as several billion dollars annually, and could be governed largely by the amount of slack that needed to be taken up in order to provide continuity of income. This aspect of work programs is stressed in the forthcoming report of the Board's Committee on Long-Range Work and Relief Policies. The program could be expanded or curtailed with relative rapidity, in the light of the needs for achieving a proper balance between the actual demand for the products of our economy and the available worker force.

#### Organizing the "Shelf" of Projects

To the National Resources Planning Board there has been assigned by the Congress and the President the responsibility for organizing a "shelf" of useful and needed projects to be undertaken when the end of the war will make it possible for us to devote our energies to the task of building up the Nation. Out of the Employment Stabilization Act of 1931, Reorganization Plan No. I, and the Executive order establishing the procedure for the formulation of a 6-year Federal public works program, come these responsibilities.

The organization of such a shelf is not a simple matter. More than 50 Federal Government agencies are involved and thousands of State and local government units. The Federal Government undertakes programs of construction and improvements directly, makes grants to assist State and local governments in undertaking them, makes loans and guarantees loans to State and local governments and to private persons to aid in the undertaking of others. The proper preparation of a shelf of all such projects involves the coordination of the program as a whole with the fiscal and budgetary controls of both Federal and non-Federal governments.

For soundness, it must be based upon thorough-going physical, economic and financial planning.

Under the provisions of Executive Order No. 8455 the Board has already accomplished considerable organization of the Federal project portion of this shelf. The operations of that Executive order and the procedures used in programming Federal public works were described in our report last year, "Development of Resources and Stabilization of Employment in the United States, 1941." That part of the program proposed for undertaking in the fiscal year ending June 30, 1943, is described in Section 3, following, and Appendix B of this report.

Although the number of Federal agencies involved is not so great, the extent of the Federal Government's influence through grants-in-aid, loans and guaranties of loans, on the total volume of public works construction is many times greater than that brought about through direct expenditure. Consequently, the organization of the Federal Government's public-works assistance activities is of paramount importance in our general objective of employment stabilization. The problems encountered here are simpler in the respect that there are fewer Federal agencies concerned; and at the same time more complex, since the policy decisions of thousands of non-Federal agencies are involved. The organization of such programs, however, has made considerable progress. The relationships between the agencies engaged and the National Resources Planning Board are given formal status under the provisions of Executive Order No. 8455. In Section 4, following, there will be found a more complete description of these relationships.

The problem of establishing a proper organization for a shelf of State and local government projects is the most complex of all. Properly speaking, there should be many shelves, fully organized, in the States and cities themselves. Most appropriately, the Federal Government should be in command of information as to what is on those many shelves in order to coordinate them.

In view of these considerations, the National Resources Planning Board some time ago developed a method of long-range programming of State and municipal public works designed to be utilized by the officials of State and local governments.<sup>3</sup> Working through the Board's regional offices and State and local planning boards, the use of this programming method has been strongly encouraged. The method itself and the success that has been achieved in having it adopted throughout the country are reported in more detail in Section 5. In that section will also be found the discussion of the Public Work Reserve, an operation jointly sponsored by the Federal Works Agency and by the National Resources Planning Board and made pos-

sible through Work Projects Administration financing. It is designed to further adoption of public works programming as an administrative procedure by State and local governments, and to contribute to the organization of the shelf of State and local projects. The validity and usefulness of projects in any program must be measured in terms of their relation to comprehensive long-range plans or patterns of community growth and community life. To provide orderly procedures for preparation of such comprehensive plans, the Board and its field offices have experimented with a type of "Area Analysis" indicating needed public works in rural areas, and with a progressive planning technique in urban areas.

If public works planning is well done at both the Federal and non-Federal levels of government, the adjustment of national policy to achieve the aim of employment stabilization will be immeasurably simplified. When fully developed, the programming operation will yield information at all times as to the extent to which the Nation's public works activity may be anticipated over a period of years. Federal policies for expansion or contraction might then be determined in that light.

For example, if examination of the program disclosed that the total amount of public works construction would be inadequate to fill its rightful place in our national economy, the Federal policy might be modified in any one or more of several directions to bring about its enlargement. Federal budgetary expenditures might be increased, the extent of grants-in-aid for non-Federal construction might be enlarged, or the scope of loans or loan guaranties might be widened. Conversely, a retraction along any of these lines would bring about curtailment if curtailment seemed most desirable in the interest of a healthy economy.

To approach closer to the goal of adequate preparation for the post-war period, at least with a shelf of public works programs, the Board made certain recommendations in its report last year which culminated in two bills in Congress<sup>4</sup> to amend the Employment Stabilization Act. Under this proposed amendment not only would public works programming be greatly facilitated, through assistance to the States and cities for that purpose, but funds would also be available for surveys and investigations, the essential comprehensive community plans, and the making of actual designs and specifications. An adequate program for 5 or 6 years in advance, made up of completely planned projects known to be of the maximum usefulness in developing the Nation, with an appropriate number fully designed and ready for construction, would put us in a position to realize the true potentialities of public works in our post-war program.

<sup>3</sup> *Long-Range Programming of Municipal Public Works*, N. R. P. B., June 1941.

<sup>4</sup> S. 1617, introduced by Senator Wagner of New York, and H.R. 5638, introduced by Representative Beiter of New York.

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## PART II

### 2. PROGRESS IN PUBLIC WORKS PLANNING

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Progress of Federal agencies in public works planning is essential in making effective the policy declared by the Congress in the Employment Stabilization Act of 1931 to use public works construction as a means for employment stabilization. Furthermore, sound planning of public works is an economical and businesslike procedure of great value in the emergency, the post-war period or "normal" times.

Progress in public works planning can be measured in many ways; for example, by the sheer dollar volume of works so planned, or by the efficiency of procedures and techniques used in planning public works, evaluated in terms of the improvements in the design, location or prospective use of the works proposed for construction. It is the latter yardstick which means the most in the end, as the planning procedures that enable the construction of public works giving better or more widespread services at equal or less cost are the ones which conserve the outlay of materials, men, and public funds.

Accordingly, this section is devoted to a review of developments within the Federal Government during the past year in instituting new public works planning procedures or policies, improvements or modifications of previously existing procedures and policies, and integration of existing procedures, techniques, and policies. The section covers, first, the general scene; then, national defense activities; and, in succession, the fields of land development and protection, transportation, power generation and distribution, education, welfare, and health. Some of these same subjects are referred to in Part I of this report and others are further outlined in Part III.

#### General

During the past year, planning in general for public works and related activities has been greatly affected by three major developments. These were:

1. The policy adopted by the Supply, Priorities, and Allocations Board, as announced on October 9, 1941, under which no public or private construction projects which use critical materials may be started during the emergency unless these projects are either necessary for national defense or are essential to the health and safety of the people.

2. The consideration of legislation by the Congress, pursuant to the President's recommendation in his message of March 17, 1941, to enable the making of surveys, investigations, and plans for projects then being

deferred by the defense program in anticipation of the time when they could be utilized for job opportunities.

3. The establishment of the Public Work Reserve in the summer of 1941, an undertaking jointly sponsored by the National Resources Planning Board and the Federal Works Agency and directed toward providing a basis for a broad program of non-Federal public works that may be prosecuted after the reduction of emergency activities.

#### Construction Priorities

The policy statement of the Supply Priorities and Allocations Board on construction followed the earlier announcement by the Office of Production Management on September 19, 1941, of the plan to grant priority assistance for the construction of defense housing units. Neither of these policies actually forbade the undertaking of nondefense construction, yet by refusing to grant priorities for critical materials, such as steel, copper, brass, bronze, and aluminum, for such construction, certain types of public works undertakings were made difficult, if not impossible.

The net effect, from the long-range planning viewpoint, of the policy statement of the Supply, Priorities, and Allocations Board, was to divert attention from the construction to the planning of nondefense projects. Consequently, public and private engineering staffs not engaged in defense construction will find to an increasing extent that their activities will be in the nature of planning for future construction, rather than undertaking current construction.

In effect, though, the Board's statement of policy was the culmination of a warning which the President had first sounded in his Annual Budget Message on January 3, 1941, in which he said:

During this period of national emergency it seems appropriate to defer construction projects that interfere with the defense program by diverting manpower and materials. Further, it is very wise for us to establish a reservoir of post-defense projects to help absorb labor that later will be released by defense industry \* \* \* Throughout the Federal service \* \* \* projects are being deferred until a more appropriate time. However, surveys and the planning of new projects will go forward so that construction can be resumed without delay. This will produce a long list of public work projects, apart from defense construction, arranged according to priorities. Such a list could be submitted to a future Congress for the appropriation of funds to put it into operation.

Following up this policy, in his message of March 17, 1941, transmitting the annual report of the National



Resources Planning Board on the "Development of Resources and the Stabilization of Employment in the United States", the President said:

Because of the current national emergency, projects not needed for defense have been temporarily deferred. As a result, we are now in the process of storing up a reservoir of nondefense work which can be loosed when the pace of rearmament slackens \* \* \* If projects are to be ready at hand for rapid inauguration in times of need, the surveys and investigations, the engineering plans and specifications must be prepared in advance. Authorizations and financial arrangements must be already agreed upon. The planning \* \* \* fund, suggested in the Board's report, would make available a shelf of useful projects without in any way committing the Government to the immediate construction of such works.

#### Planning Legislation

In response to these recommendations of the President, identical bills were introduced into the Senate and House during the first session of the Seventy-seventh Congress.<sup>1</sup> Under the proposed legislation, the Employment Stabilization Act of 1931 would be amended by authorizing the appropriation of funds to the President "for the making of such examinations, surveys, investigations, legal studies, comprehensive plans and programs, engineering plans and specifications, and forms of legal proceedings, as may be necessary to facilitate and expedite the selection, financing, and inauguration of public improvements, works, and related activities." The President would be authorized to allot funds for those purposes to agencies of the United States and to make advances to the States, Territories, and island possessions, and their agencies and political subdivisions.

As the National Resources Planning Board pointed out in its report last year to the President, its experience during the past decade has clearly shown that the policy declared by the Congress in the Employment Stabilization Act of 1931 needs to be implemented further by the advance provision of funds to be made available by administrative allocation to Federal agencies, and to State and local governments for preliminary studies and for the plans and specifications for public works and related activities, with the clear understanding that such advances would represent in no sense a commitment to undertake such projects at any time. The provisions of the proposed bills authorize the appropriation of funds for just such purposes.

The proposed legislation would enable the appropriation of funds to carry on the following specific activities:

1. *Examinations, surveys, and investigations* could be undertaken by one or more Federal agencies in cooperation with each other or with such State and local governmental agencies as may be concerned, directed toward the preparation of comprehensive plans and programs for the protection and develop-

ment of the resources of the Nation. These studies could cover a single proposed project or a group of them, a drainage basin area, a land use area, a forest or a mining region—in fact, the area to be covered would be largely determined by the type of problem or resource under consideration.

2. *Legal studies and forms of legal proceedings* could be undertaken looking toward the avoidance of legal obstacles and the delays now often encountered before public projects can be undertaken. Most local governments are subject to strict constitutional and statutory requirements in the making of loans and contracts, involving cumbersome and lengthy procedures and often including the necessity for special elections. Using the experience of the last 7 years it should be possible to suggest new procedures which, upon adoption by State and local governments, might materially reduce the length of time necessary to get projects under way.

3. *Comprehensive plans and programs* could be developed in order to provide adequate consideration of all the developmental needs of a community or area in appropriate balance and to establish the best order of undertaking the most needed projects. Such plans and programs could be prepared: (a) by Federal agencies; (b) by joint action of the Federal, State, and local agencies concerned; and (c) by State and local governments covering only their own activities with financial and technical assistance from appropriate Federal agencies.

These comprehensive plans and programs would be the means by which individual projects proposed as a result of the surveys and investigations could be placed in their proper relationship to one another so that the development of any individual area or region in the Nation would follow a well-considered pattern. This procedure makes possible the provision of roads and schools coincidental with the opening of new lands; the building of community facilities in tempo with new industrial developments; and the rehabilitation of cities by removing blighted areas in accordance with long-term plans.

One way to minimize a sharp drop in the volume of State and local public construction during a depression period is to encourage the formulation of long-term programs of public improvements and the corresponding financial plans. Long-range programming of State and local public works, in conformance with the financial resources of the governments involved, would go far toward smoothing out the curve of State and local activity, and also would provide a sound basis of administration for any financial assistance which the Congress might decide to make available during periods of depression.

<sup>1</sup> S. 1617, Introduced by Senator Wagner of New York; and H. R. 5638, Introduced by Representative Belter of New York.

4. *Engineering plans and specifications* could be prepared by two different procedures:

a. Allotments could be made to Federal agencies for the preparation of detailed plans for those projects in their 6-year advance programs. Over the past 10 years, and prior to the defense program, the Federal Government has spent on the average \$500,000,000 annually for "direct" Federal construction projects. Currently it is estimated that such Federal agencies have completed detailed plans for a backlog of only about \$265,000,000 of projects. This would be less than the expenditure in an average year. To carry out the declaration of policy by the Congress in the Employment Stabilization Act, detailed construction plans should be available for not less than 1 year in advance, i. e., they should cover not less than \$500,000,000 of Federal direct construction.

b. Advances could be made to State and local governments for the preparation of detailed plans for individual projects in the comprehensive advance plans and programs of State and local governments. Prior to 1931 and the decline in the total volume of non-Federal public construction, State and local public construction averaged more than 2 billion dollars a year, reaching a high of approximately 2.5 billion dollars in 1930. Preparation of detailed construction plans should cover not less than 1 year of such construction in advance, if the Federal grant-in-aid and loan agencies are also to carry out the policy declaration of Congress.

Four points should be noted in connection with the proposed legislation:

1. The authorization of appropriations which the bills propose supplements existing authorizations of Federal agencies for survey and planning work. The proposed authorization would not supplant any existing authorizations.

2. Any allotments or advances from funds appropriated under the proposed authorization would not represent, in any sense, a commitment by the Congress to appropriate funds to undertake at any time the projects covered by plans made under such allotments or advances.

3. The bills provide for advances to State and local governments for plan preparation by their own staffs and consultants. They do *not* propose Federal domination of the design and planning work of State and local governments; nor do they propose that the Federal agencies should create staffs to replace the staffs of such State and local governments.

4. The bills provide a form of insurance against the time when "emergency" programs again may be necessary. They assure that if and when such time comes, plans will be ready and, if the Congress so legislates, men and materials can be put to work more quickly and on better undertakings than would be the case otherwise.

The objectives in using public works and related activities as means for obtaining employment stabilization have always been twofold: (1) The building of works and the supplying of services to meet the needs of the country; and (2) providing employment for idle men and resources during any period of depression.

A continuing planning policy such as the legislation proposes would make it possible to prepare plans considerably in advance for projects that might be included in public improvement programs. Then, if and when the Congress provided appropriations for expanding such programs quickly, projects with high National, State, and local values could be selected to give immediate employment. Administration of the program would be facilitated to the extent that project selection could always be in terms of the two criteria—employment created and urgency of the need for the improvement.

#### Public Work Reserve

Pending the enactment by the Congress of a continuing planning policy, and in order that a basis can be laid for a broad program of public works that may be prosecuted after the reduction of emergency activities, the Public Work Reserve has been jointly sponsored by the National Resources Planning Board and the Federal Works Agency, operating as a Work Projects Administration project. This operation is coordinate with the efforts of the Federal Government to provide a 6-year program and to encourage State and local agencies to prepare programs of public works. The objectives of the undertaking are described in the section on "Non-Federal Planning" later in this part.

While the Public Work Reserve can well serve as an interim measure, the general inventory of need which is being undertaken is not enough, and permanent legislation, along the lines of the President's recommendations in his message of March 17, 1941, will be required to provide for the investigations, surveys and preparation of detailed construction plans which are so essential before the "dirt can fly."

#### National Defense

As the defense and war effort has increasingly absorbed our national energies during the past year, the Nation has become acutely aware of the value of planning for and in an emergency. Camp and cantonment construction, defense-industrial plants, defense housing, and community facilities in critical defense areas have all served to hammer home the lesson that delays, increased costs and confusion as to related plans are sure to appear in the absence of planning.

#### Camp and Cantonment Construction

The most significant recent advance in the planning of military works is the advance preparation of a pro-

gram for future camp and cantonment construction. Beginning late in 1940, the War Department embarked on a construction program to expand existing posts and to create new posts in a limited time to accommodate the increased strength of the Army. The original estimates of cost for the construction of these camps and cantonments proved to be inadequate, so that a large supplemental appropriation was necessary to complete the program. The committees of Congress examined very carefully the need for additional funds; and the Special Senate Committee Investigating the National Defense Program concluded that, "the *principal reason* for the inability to make proper estimates and for the undue expense of the program was the *lack of adequate plans*."<sup>2</sup>

In order to meet this demonstrated need for advance planning of military construction, the Congress appropriated the sum of \$15,000,000 for advance engineering plans and surveys. In reporting this proposal to the whole House, the House Appropriations Committee stated:

The Committee has included in the amount for military-post construction an item of \$15,000,000 for engineering surveys. Colonel Somervell has advised the Committee that with such a sum the War Department could avoid many of the factors of the overrun of the present program in connection with any future construction. Such a study can be completed in this fiscal year and will result in providing an essential measure of preparedness both in the point of time and cost on any future construction that may become necessary.<sup>3</sup>

Using these funds provided by the Congress, the Construction Division of the Quartermaster Corps prepared plans for future construction in accordance with the following procedure:

1. Survey boards composed of the zone construction quartermaster, an engineer officer, a medical officer, and a representative of the army or branch of service concerned studied the sites available for location of camps and, on the basis of their studies, recommended certain sites to the Department.

2. Upon notification of approval of the recommendations of the survey boards, the Quartermaster General proceeded with the letting of contracts to private architectural and engineering firms for the planning of the camps. The funds made available were limited to planning work, and none could be used for construction or acquisition of land without an express authorization from Congress.

3. The plans and layout, upon completion, were filed for future use, when and if Congress authorized an expansion of the Army.

In this way the War Department has used advance planning as a form of insurance against the war emergency.

A further significant advance in the planning of military works is the recently enacted proposal for smoothing out the cycle of civil-military construction. This proposal is contained in the legislation transferring the construction activities of the Quartermaster Corps to the Corps of Engineers. Until very recently the Quartermaster Corps has been charged with the construction, maintenance, and repair of buildings, structures, and utilities connected with the Army. Since there has been no large amount of building construction for the Army in "normal" times, the construction organization of the Quartermaster Corps has been very small. With the coming of the defense emergency, the Quartermaster Corps has had to build its organization from the ground up—it has had to build its organization at the same time that it has been building camps. The Corps of Engineers, on the other hand, has directed in normal years a vast amount of construction work on civilian projects—river and harbor and flood control works. As a result, the Corps of Engineers maintains in normal times a well-established, decentralized, and active organization for construction work. In war or in time of national emergency it requires no great effort to turn that organization to the task of building what may be needed for the Army.

The effect of the legislation transferring the construction activities of the Quartermaster Corps to the Corps of Engineers is to centralize all major construction activity of the War Department, both civil and military, in a single agency. Such centralization allows for considerably more effective planning in smoothing out the cycle of civil-military construction.

#### War Industry Plants

The selection of sites for the location of new war industry plants has presented a major planning assignment as described in Part III of this report dealing with the Industrial Location Studies of the National Resources Planning Board. The technique used is based upon the integration of many Federal agencies' planning activities through the medium of the Plant Site Board established within the Office of Production Management. The Plant Site Board is instructed in the regulation establishing it "to work in close cooperation with representatives of each such department, corporation, or agency from the outset of the process of selection of the location of any plant or facility."

The initiation of negotiations for the selection of sites for industrial facilities in connection with the war program is in the hands of the technical agencies responsible for assuring an adequate supply of the articles to be produced, such as the Ordnance Department and Air Corps of the War Department, the Bureau of Ships of the Navy Department, and the Maritime Commission. The initiating organization prepares a statement

<sup>2</sup> "Camp and Cantonment Construction," Senate Report No. 480, Pt. II, 77th Cong., 1st sess. *Italics* have been added.

<sup>3</sup> House Report No. 152, 77th Cong., 1st sess., accompanying H. R. 3617, the Fourth Supplemental National Defense Act of 1941.



describing the site proposed, indicating the requirements in terms of labor, power, transportation, water, raw materials, etc., and how it is proposed that these requirements be met at the recommended location. This proposal, with all available information, is then transmitted to the Plant Site Board.

On the basis of the requirements submitted with the proposal, the staff of the Plant Site Board secures all available data with respect to the resources of the community for which the plant is proposed. In securing the data for the use of the Plant Site Board, reliance is placed primarily on existing Government agencies and no considerable staff has been built up for the Site Board itself. For example, comments on the availability of power are secured from the Federal Power Commission and from the Power Consultant of the Office of Production Management; on availability of housing, from the Coordinator of Defense Housing; on other public facilities, such as schools, hospitals, sewage and water facilities, from the Office of Defense Health and Welfare Services; on labor supply, from the Labor Division of the Office of Production Management, the Bureau of Employment Security, the Bureau of Labor Statistics, and the Office of Agricultural Defense Relations; on data relating to the geographical distribution of defense industry, from the Division of Contract Distribution, Office of Production Management. General comments and data are secured from the National Resources Planning Board and from the Plant Location Section of the Bureau of Research and Statistics, Office of Production Management. In this way, prompt and expert advice is secured without duplicating existing agencies and personnel.

When favorable action is taken by the Plant Site Board, the initiating organization prepares, for approval by the President, a definite recommendation for plant location.

Several means have proved useful in assuring that the tentative site selected is the most feasible before the project is submitted to the Board for formal action. In the first place, the Plant Site Board has made provision for receiving preliminary proposals of sites under consideration by the technical agencies and for expressing informal opinions with respect to them. The Plant Site Board also expresses general views to the War and Navy Departments with respect to types of plants which it feels will most efficiently utilize the resources of various regions of the country; provides them with data on communities where housing and labor shortages exist; and recommends lists of communities which seem to deserve prior consideration for various types and sizes of plants.

The work of the Industrial Location Section of the National Resources Planning Board in connection with these activities is described in Part III of this report.

### Defense Housing

The determination of defense housing needs at expanded Army, Navy, and defense-industrial establishments, and the programming of these needs for each locality, in accordance with the dwelling units to be assigned to private, public-aid, and public construction, is a planning function. Since the Federal housing agencies are scattered among several departments and agencies, it would have been difficult for any one of the existing agencies to program total housing needs. Therefore, this planning function has been assigned to a Coordinator of Defense Housing in the Office for Emergency Management.<sup>4</sup>

The development of the technique of "programming" defense housing in a given locality marks the first time that any one agency of the Government has attempted to take an over-all view of housing needs for a given community, and, upon the basis of the plans and surveys of other Federal, State, and local agencies to recommend a coordinated housing program. As such, it is not only a new planning procedure but, more important, it provides for the integration of existing planning activities and surveys.

To determine housing needs, the Division of Defense Housing Coordination must, first of all, gather facts. The Office of the Coordinator must have full and accurate information on all aspects of the housing situation in defense areas.

The Coordinator relies mainly upon five existing Federal agencies to secure necessary information. The Bureau of Employment Security of the Social Security Board, in collaboration with State employment agencies, makes surveys of labor demand and supply; the Work Projects Administration makes accurate, detailed vacancy surveys on a uniform basis; the Bureau of Labor Statistics provides information on the volume of private residential construction; the Federal Housing Administration has extensive housing market analyses available which they use to guide their insuring operations; and the National Resources Planning Board assists in relating proposals to community and regional development plans.

Other surveys than those of the type described are made by State and local organizations, and by Federal agencies concerned with other aspects of defense housing needs. Those made specifically for the use of the Coordinator's office include surveys of labor and housing in rural areas by the Federal Security Agency, in cooperation with the Bureau of Agricultural Economics, and surveys of rentals, which are made at the joint request of the Office of Price Administration and the Division of Defense Housing Coordination, by the Bureau of Labor Statistics in the larger cities and metropolitan areas, and by the Work Projects Adminis-

<sup>4</sup> Executive Order No. 8632, January 11, 1941.

tration in smaller cities. Other surveys, not made at the direct request of the Coordinator's office, frequently are of assistance. Among these are the general surveys of defense areas made by the National Resources Planning Board, in cooperation with the Office of Defense Health and Welfare Services, the surveys of the need for additional community facilities made by the Work Projects Administration, in cooperation with other Federal agencies, and the surveys of migration into defense areas made by the same agency.

After all information has been studied and analyzed, the net need for new construction in a locality is ascertained by the Coordinator of Defense Housing, and this need is tentatively programmed as between public and private construction. To this end, tentative Locality Program Reports are prepared, presenting a description of the defense activity, the labor requirements and supply; a survey of the housing situation; and the determination and programming of the net housing need. The tentative Locality Program Reports are reviewed by the housing agencies, offices within the Office for Emergency Management, and the National Resources Planning Board. The comments of the reviewing agencies are submitted to the Coordinator for his consideration.

On the basis of the tentative Locality Program Reports and the comments of the Federal agencies who have reviewed these reports, the Coordinator of Defense Housing prepares definite Locality Program Reports to be submitted to the President for his approval. These reports form the basis for the determination of need by the President, as required by legislation for public housing construction.

The over-all locality planning of the housing having been completed, the programs are then turned over to the appropriate Federal agencies or to private builders for construction and operation.

The Locality Program Reports prepared in cooperation with, and reviewed by, the Federal agencies concerned, enable the type of joint planning which eliminates duplicating efforts and conflicting recommendations. These reports which are the end product of the Coordinator's planning surveys, represent a technique that may be applicable in other fields of public works planning.

#### Defense Public Works

The location of cantonments and new industrial plants under the defense program, has in many instances, placed heavy burdens upon community facilities—schools, water supplies, health services, and the like. In order to help affected communities meet these problems, the President, as early as October 10, 1940, made an allotment to the National Resources Planning Board from his emergency funds to be used

for rendering technical assistance to such communities in planning for the solution of critical conditions and for necessary emergency development. This work is described in Part I of this report. In performing this assignment, the regional officers of the Board report locations of exceptional growth resulting from defense activity and, on the basis of this information, consultants are assigned for short periods through State planning agencies to assist communities with the technical aspects of critical local problems. The provision of these consulting services is a further development in the technique of helping the States and their local subdivisions to help themselves, rather than imposing upon such governments arbitrary and, sometimes, unnecessary action.

The coordinated planning of health, welfare, and related activities in critical national defense areas was made the responsibility of the Office of Defense Health and Welfare Services by Executive Order No. 8890 of September 3, 1941.<sup>5</sup> In order to bring defense health and welfare planning down to the local level, a Regional Advisory Council has been established in each of the 12 regional offices of the Office of Defense Health and Welfare Services. This Council consists of the Regional Director of the Office of Defense Health and Welfare Services, as Chairman, and representatives of other Federal agencies whose field activities in defense areas are related to those for which the Office is made responsible. In addition to coordinating the planning of Federal health and welfare programs in defense areas, the Office has also given assistance to the planning of State and local programs. Upon request, the services of health and welfare specialists are made available to States and localities for the planning of their special programs at defense centers.

The procedure adopted by the Office of Defense Health and Welfare Services of regionalizing its planning operations, and cooperating with and extending planning assistance to State and local agencies, closely follows the pattern of similar planning operations of other Federal agencies. While the procedure has been installed as an "emergency" measure, the necessity for it has long been recognized.

The determination of need for federally financed defense public works under the Community Facilities Act of June 1941,<sup>6</sup> and the programming of projects to meet these needs for different localities, required new planning procedures. To this end the Federal Works Agency has developed cooperative relationships with the Office of Defense Health and Welfare Services and with the National Resources Planning Board to aid in the selection and planning of such defense

<sup>5</sup> The Office succeeded to the functions of the Office of the Coordinator of Health, Welfare, and Related Defense Activities, created on November 23, 1940, by order of the Council of National Defense.

<sup>6</sup> P. L. 137, 77th Cong., 1st sess., to provide Title II of the Lanham Act.

public works. For example, in programming all education, health, and recreation facilities, the Federal Works Agency obtains certifications of need from the Office of Defense Health and Welfare Services or the constituent agencies of the Federal Security Agency. In this respect, it should also be noted that the Public Health Service, in the summer of 1940, and the Office of Education, in the fall of the same year, had, each in cooperation with related State and local agencies, made advance surveys of emergency construction and service needs throughout the country resulting from the defense program.

In order to program the defense public works projects requested by local governments, the Federal Works Agency, at the outset of its operations, organized a review committee for each of its administrative regions. This committee usually consisted of the regional representative of the Federal Works Agency, and representatives of the Office of Defense Health and Welfare Services, the National Resources Planning Board, other affected Federal agencies, and State planning boards. These committees, in addition to obtaining general cooperation in the field between those government organizations concerned with the supply of community facilities in defense areas, also assigned general priorities to project applications submitted for the region. These priority recommendations were taken into consideration by the Washington Office of the Federal Works Agency in the selection of projects to be submitted to the President for approval.

More recently, a procedure has been inaugurated jointly by the Office of Defense Health and Welfare Services and the National Resources Planning Board, with the cooperation of appropriate Federal, State, and local defense and planning agencies, to provide over-all reports on defense areas where the impact of the defense program is causing social disorganization, over-crowding and boom-town growth. These reports are being prepared as a basis for guiding the action programs of Federal agencies, and those of the State and local governments as well. As such, they are, in effect, a planning report of the background of conditions, needs, and action that appears necessary. In the end, and on the level of the Federal Government alone, they should ultimately serve to prevent any confusion as to the relationship of plans for health, welfare, education, housing, and civilian defense. Consequently, they are a logical development in the technique of Locality Program Reports employed by the Coordinator of Defense Housing in the field of housing alone.

### Land Development and Protection

All physical planning has a relation to the use and, broadly speaking, the development of land. The problems of camp and cantonment planning and the loca-

tion of defense industry establishments, while looked upon as national defense undertakings, really involve questions of land development. Thus, while this part of the discussion involves new procedures for planning land development and protection, it covers the subject only in a very technical sense—the general field of agricultural land-use planning, flood control, irrigation, park and forest development and soil conservation activities. And, although national defense is absorbing a large part of our time and energy now, some new techniques and procedures have been instituted during the past year for planning the development and protection of our land resources—procedures which will have a profound effect on the post-war world.

### General

In May, 1941, the Secretary of Agriculture established an Interbureau Coordinating Committee on Post-Defense Programs for the Department of Agriculture. This Committee was directed to draw up the broad outlines of a national program of public work in the agricultural field—a program to deal comprehensively with forestry, soil conservation, land use adjustment, flood control, rural housing, range improvement, water facilities, and other appropriate matters. In setting up this Committee, the Secretary of Agriculture said:<sup>7</sup>

In the event that public activities which provide employment, conserve resources, and promote human well-being and security are expanded greatly when defense activities slacken and men who will need useful employment are released from defense jobs, we will need to have in readiness plans that would permit the Department to participate in the program with the maximum of efficiency and results.

An order issued in September, 1941 by the Secretary of Agriculture to broaden the scope of the Committee's activities now divides the post-defense planning work into the following three lines of inquiry:

1. *General economic problems* covering particularly the relations of agriculture to industrial development. Following the lines suggested by the National Resources Planning Board of directing the Nation's efforts toward maintaining full employment in the post-war period, the Department will study the markets for farm products and the human resources available to agriculture under such conditions. The level of farm prices, the volume of farm production, the retirement of submarginal land, and the best uses of soil resources all depend in large measure upon general economic activity in the Nation.

2. *Rural works programs.*—The Department proposes to study and indicate the general needs for public works affecting agriculture, regardless of which governmental agency may appropriately undertake programs for meeting these needs; to develop programs for meeting that part of the total needs which the Depart-

<sup>7</sup> U. S. D. A. Office of the Secretary, Memorandum No. 913, May 31, 1941.

ment could appropriately undertake; and then to stimulate other State and local agencies to develop programs for work which they could undertake. At present, post-war planning for rural works is classified under three major headings:

*a. The conservation and development of physical resources*—including such activities as soil, water, forest and range conservation and development, flood control, the opening of new land, and the control of insects, pests, and plant diseases.

*b. Development of rural public facilities*—plans for the development of rural electrification and transportation, educational plant, and marketing facilities.

*c. Development of improved living conditions*—particularly capital improvement programs covering rural housing, recreational facilities, hospitals, and sanitation.

*3. Improvement and expansion of services to the rural population*—including the maintenance and operation of health, nutrition, medical, educational, recreational, and other services, as well as the development of co-operatives and improvements in land tenure practices.

The organization of this planning effort centers in the Interbureau Coordinating Committee, which is comprised of representatives of the Office of the Secretary, Bureau of Agricultural Economics, Agricultural Adjustment Administration, Farm Security Administration, Bureau of Plant Industry, Forest Service, Office of Agricultural Defense Relations, Soil Conservation Service, Rural Electrification Administration, Office of Land Use Coordination, Office of Foreign Agricultural Relations, Office of Budget and Finance, Surplus Marketing Administration, and Extension Service. Under this Committee, groups, organized to cover the three lines of activity set forth above, will develop the particular phase of the total problem which is assigned to them.

Planning for rural works and rural welfare services is handled largely by the field organizations of the Department's action agencies and the State land-use planning committees. In order to provide a simple and direct line of communication between the Coordinating Committee and the field, the States have been grouped into nine regions. Regional chairmen representing the Coordinating Committee have been designated for each of these regions. They will head committees to be made up of field officials of the several action agencies in the Department. In every case, the regional chairman is a field official who is already engaged in work closely related to post-war planning.

In implementing his organization for planning purposes, the Secretary of Agriculture stated, on September 17, that:<sup>8</sup>

The reason for all this is, of course, an intelligent concern for the future. In some quarters there is a fear that a severe eco-

nomic depression is inevitable when the defense effort ceases. The Department of Agriculture does not share this pessimism. We believe the country need never go through a major economic depression again. We visualize a post-war world in which we will make full use of our manpower and our resources for the benefit of the American people. We believe it is possible to maintain a national income greater than ever before in the history of the Nation.

It is in this setting that the Department should make its contribution in planning for the kind of world we wish to live in when the peace comes. If we plan soundly and courageously, if we enlist the help of the greatest possible number of people in making these plans, we can build an economy which will offer everybody a fair chance for work and security. Planning for this kind of future is part of the defense effort itself.

The Department's organization for planning is an interesting development in the technique of integrating and then decentralizing the planning within a far-flung Government organization. It is a form of "grass-roots" planning which will reflect national policy decisions. As such, it is comparable to the decentralized planning technique practiced by the National Resources Planning Board and more recently organized by the Office of Defense Health and Welfare Services.

#### Soil Conservation Activities

Reorganization Plan No. IV, dated April 11, 1940, transferred the activities of the Soil Conservation Service relating to soil and moisture conservation operations on certain public lands from the Department of Agriculture to the Department of the Interior. The Department of the Interior, in administering these operations, delegated the responsibilities to the various bureaus and agencies concerned with land management in the Department. These operations require a high degree of planning coordination if the objectives sought are to be realized. In recognition of this fact, the Office of Land Utilization was established in the Department.

From the beginning it was recognized that planning soil and moisture conservation and land management activities generally can best be accomplished if the various areas under administration are organized on a project area or watershed basis. Consequently, during the current year, the Office of Land Utilization has been concerned primarily with the organization of project areas and the planning of their conservation and development. Plans for project areas under development by the bureaus and agencies of the Department are coordinated in the Office of Land Utilization to insure that the individual project area plans fit into the picture for the region as a whole. While only a beginning has been made in this field, it appears certain that, when all of the planning techniques are fully developed, a comprehensive program, guided by one master policy, will be forthcoming for the conservation and development of all of the lands under the Department's jurisdiction.

<sup>8</sup> U. S. D. A., Office of the Secretary, Memorandum No. 913, Supplement No. 1 September 17, 1941.

Organization of planning activities on the basis of a developmental unit (or "project area") guards against possible confusion among different functional plans for the area. It serves to achieve a coordination of planning that no other method will provide—and it further means that plans which should be related are related while they are still plans.

In this same respect, a change in planning techniques of the Grazing Service during the past year has been of significance. Planning in this agency heretofore had been largely on a unit or community basis, and the improvements contemplated were largely such as would permit or insure better livestock improvement. While this was a practical approach and a necessary initial step in securing full cooperation of the users, it did not provide for consideration of watershed or similar areas on a project basis. Present planning of the Grazing Service is entirely on a watershed basis, consideration being given not only to the range use but also to the possible other demands or needs in the area.

#### Flood Control

While the Flood Control Bill <sup>9</sup> was pending before the Congress, the President, in a letter to the Speaker of the House of Representatives, on July 3, 1941, said in reference to that section which authorizes additional examinations and surveys for flood control:<sup>10</sup>

\* \* \* I believe that these surveys, which should not be allowed to lag, could be correlated more effectively in the future if the authority of the Corps of Engineers to revise and extend the type of basin surveys first authorized in the River and Harbor Act of January 21, 1927, could be broadened somewhat, and if provision could be made, at the same time, for the active participation of other Federal agencies concerned with multiple-purpose aspects of the surveys.

To carry out these two recommendations, the President submitted the following drafts of suggested amendments to the bill:

1. "The Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys for flood control to be made under the direction of the Chief of Engineers in drainage areas of the United States and its territorial possessions, including the following-named localities; and the Secretary of Agriculture is authorized and directed to cause preliminary examinations and surveys for run-off and water-flow retardation and soil-erosion prevention on such drainage areas." \* \* \*

2. "Whenever the Chief of Engineers in making any preliminary examination or survey for flood-control purposes finds it desirable to include in such examination or survey an investigation of one or more related purposes of water use and control, he shall request the participation (which is hereby authorized) of the Department of the Interior in any such investigation

relating to irrigation development, to the recreational development of reservoirs and waterways, or to the conservation of aquatic and other wildlife, of the Federal Power Commission in any such investigation relating to electric power development, and of the Federal Security Agency in any such investigation relating to the abatement of water pollution and the provision of domestic and industrial water supply, and in his report to the Congress on any preliminary examination or survey the Chief of Engineers shall include the reports of the participating Federal agencies."

The first of the President's suggested amendments was enacted into legislation; the second was not included in the law.

Prior to the passage of this Act, the authorization of all surveys for flood control originated with the Congress. Persons familiar with the procedure of the Corps of Engineers in making flood-control investigations will appreciate that this new provision in respect to survey and planning procedures will make for flexibility and will tend to broaden the scope of investigations of complex flood situations by enabling the reporting officer to consider all related phases of a complex flood problem without overstepping the areal or functional limits of a Congressional authorization. Moreover, the Act also authorizes the Secretary of War to review any examination or survey and submit a report thereon to Congress if such a review is required by the national defense or by changed physical or economic conditions. This latter provision also makes for greater flexibility in survey and planning procedures.

Another significant development during the past year in the flood-control field was the initiation of the practice of studying in its entirety what might be termed a typical watershed. The reports of the Corps of Engineers and of the Department of Agriculture on the watershed of the Trinity River, Tex., gave for the first time a basis for collaborative effort toward a unified plan for flood control and retardation of soil-eroding water flow on a typical stream, as contemplated under the Flood Control Acts. These studies and reports were so timed as to become available within a few months of each other, so that their findings could be considered together in relation to individual projects proposed for the basin.

#### Irrigation

*Water Facilities Program.*—The need for coordination of programs and policies relating to agriculture has led to the unification of the area planning function within the Department of Agriculture. As early as October 1938 the Secretary of Agriculture provided for greater coordination of area planning by his reorganization within the Department. A further step in such coordination is found in the recent revision of procedures with respect to planning under the Water Facilities Act.<sup>11</sup>

<sup>9</sup> Enacted as Public Law 228, 77th Cong., 1st sess.

<sup>10</sup> H. Doc. No. 301, 77th Cong., 1st sess.

<sup>11</sup> P. L. 399, 75th Cong., as subsequently amended.



The changes are reflected in two new statements issued by the Department in January 1941: the "Water Facilities Area Planning Handbook," and the "Water Facilities Procedure Manual."

The Handbook considers in detail the function of water facilities area planning. In accordance with other Departmental policies, the planning of the water-facilities program is divided into two functions. The first function is generalized or over-all area planning, which is concerned with a watershed or other natural province. The area is studied as a unit in the development of a plan for the use of natural, man-made, and human resources in the best interests of the people. The second function is that of detailed or operational planning.

As one means of achieving closer coordination in the area-planning phase of this program, work outlines are prepared, in advance of investigations, for the individual areas approved for planning. The work outline, developed by agreement among interested bureaus, is designed to encourage maximum contribution by all agencies in the form of suggestions and assembly of data. The Handbook furnishes a list of factors which should be considered in preparing work outlines and presents a discussion of these factors. The actual procedure followed in the preparation of work outlines is covered in the "Water Facilities Procedure Manual."

The Handbook, in addition, serves as a guide for the making of field investigations and, to promote uniformity, as a standard for the text of the area plan. The procedure followed in plan preparation, as well as that for operation, is outlined in the Manual.

Planning under the Water Facilities Act has also made necessary a coordination of planning activities between the Department of Agriculture and the Department of the Interior. In a continued effort to simplify the procedure for considering the interest of agencies of the Department of the Interior in those areas where the services of the Water Facilities Program are to be made available, the extremely important procedure of cooperative reporting by field representatives of the Departments of Agriculture and of the Interior has now been put into operation.

Field representatives of the Department of Agriculture, upon receipt of information that a specific area proposal is to be prepared, inform representatives of the Department of the Interior and invite their comments. Representatives of the Department of the Interior are present at any meetings held for discussion of the area proposal with local or State land-use planning committees. Field representatives of the Department of the Interior forward their observations to the Washington office to enable the Departmental officers to submit final comments to the Water Facilities Board of the Department of Agriculture at the time the area proposal is finally considered for planning. The ob-

jective of this arrangement is to insure that all interests in an area are considered together at the time an area proposal is discussed with local farm and ranch groups. The interests of affected Government agencies are considered before actual plan preparation begins.

*Water Conservation and Utilization Program.*—In the field of irrigation development under the Wheeler-Case Act,<sup>12</sup> substantial progress has been made by the agencies responsible for planning the program in improving coordination of the investigating and reporting of projects. One of the foremost instances of such improved coordination is the newly exercised function of the Farm Security Administration in determining need for land-use readjustment and for rehabilitation of farmers in areas being studied for potential Wheeler-Case projects. After the areas of proposed operations are laid out, liaison between the Departments of Agriculture and of the Interior is now maintained by the field staff of the National Resources Planning Board from the inception of planning for the project to its completion.

Another forward step in the planning of these projects has been in the further development of the criteria for determining their economic justification. Currently, the following questions are being given thorough study by the interested agencies, with the view of reaching an agreement as to what constitute desirable criteria:

1. What is present land use and type of farming in project and surrounding area; how many acres are irrigated and how many acres of irrigable land are unirrigated?
2. What is the proposed readjustment in land use and type of farming in project and surrounding area, including amount of irrigable land for which new or supplemental water will be available?
3. How many farm families now depend upon this land, and how many additional farm families will be enabled to settle on the project?
4. What is present economic condition of farmers in the project and surrounding area and how will their situation be affected by development of the proposed project? What is present WPA load in the area available for construction of the project, and how will it be affected by prosecution of the project?
5. What is the expected change in farmer income, i. e., increase in gross income, increase in farm production costs, and increase in net farmer income?
6. What are over-all costs and benefits of the project for some period of years?
7. What effect will the project have upon the economy in the vicinity of the project?

*Joint Investigations.*—The initiation of the joint procedure among Federal, State, and local agencies for the

<sup>12</sup> P. L. No. 398, 848, 76th Cong.

planning of the Columbia Basin Project of the Bureau of Reclamation is beginning to bear results; the first report appearing early in the fall of 1941. The technique of the joint investigation, as it has been applied to the Columbia Basin, has met with such success that the Bureau is considering applying it to other projects. The Pecos Joint Investigation is also nearing completion. Data has been correlated by the staff of the National Resources Planning Board at the request of the Governors of Colorado, Nebraska, and Wyoming to explore the desirability of a joint investigation of the Platte River Basin. Joint investigations may now be considered an established planning technique which provides, through the cooperative efforts of Federal, State, and local agencies, for the most desirable program practicable for the area.

#### Forest and Park Development

Another study of great importance to future planning efforts drew to a close this year when the Special Joint Congressional Committee on Forestry submitted its report on March 24, 1941.<sup>13</sup> The investigations of this Committee were undertaken in response to a suggestion of the President, made in March 1938, through a special message to the Congress, in which he called attention to our forest problem and to the need for a policy and plan of action with respect to it. Based upon its hearings and investigations extending over nearly 3 years, the final report of the Committee provides the recommendations upon which several changes in planning procedures and techniques may be based.

As a result of its studies, the Committee made a series of 16 recommendations which will have a profound effect on forest-planning procedures if they are enacted into law. While the recommendations have not yet been effectuated by legislation, it is significant that the underlying principle of the Committee's report is that the maintenance of the Nation's forest resources must be planned in accordance with a long-range policy and program directed toward a public control of exploitation.

With regard to park development and recreation a somewhat different approach to the land-planning activities of the National Park Service is being evolved through the organization's cooperation in drainage basin studies. The most notable of this new type of recreational study is the survey of recreational resources of the Colorado River Basin which the Service is conducting in collaboration with the resource studies of other agencies concerned with that basin. Here the National Park Service is working to assure that the internationally known recreational resources of the Colorado River Basin will receive full recognition in any plan for the coordinated development of that

watershed. The studies now being conducted should result in a wise use of all the resources, so that each development would be supplemental to the others in the basin's economy.

#### Evaluation of Land Projects

Finally, note should be taken here of the development of statements of criteria for the evaluation of land-use projects under the guidance of the Land Committee of the National Resources Planning Board. The Committee's statements on this subject comprise Section 5 of Part III of this report.

#### Transportation

##### General

Two planning procedures in the general field of transportation during the past year have been of prime importance.

First, the National Resources Planning Board, in order to carry out a Presidential request for a study of the Nation's transportation problems, set up a Transportation Committee to serve in an advisory capacity to the Board for a comprehensive study of transportation policy.<sup>14</sup> For the first time in history of the Federal promotion and regulation of transportation, all of the heads of the Federal Government's transportation agencies met as a committee for an over-all study of problems in the field. The relation of this study to post-war problems and possibilities is discussed in Section 2, Part III of this report.

The work of the Committee has been organized at three levels:

1. At the request of the Board, a series of reports on the several modes of transportation have been prepared by staff members of other Federal agencies concerned with transportation problems.

2. The staff of the Planning Board has synthesized all available materials and brought them to bear on the problem of formulating a coordinated transportation policy.

3. Salient findings and recommendations have been gleaned from the agency reports and staff syntheses to form an integrated statement of transportation policy.

While the staff work on this study has been largely completed during the past year, the final report will not be available until 1942.

Second, the activities of the Board of Investigation and Research, created under Title III of the Transportation Act of 1940, got under way with the appointment of its members,<sup>15</sup> and an appropriation of \$346,500 to

<sup>13</sup> S. Doc. No. 32, 77th Cong., 1st sess.

<sup>14</sup> The Committee consists of Owen D. Young, Chairman; and representatives of the Department of Commerce, the Federal Loan Agency, the Interstate Commerce Commission, the Corps of Engineers, the U. S. Maritime Commission, the Public Roads Administration, and the Civil Aeronautics Board.

<sup>15</sup> Nelson Lee Smith (Chairman), E. C. Childs, Robert E. Webb.



carry on its work.<sup>16</sup> The Board, under the Act, is charged with investigating:

1. The relative economy and fitness of carriers by rail, highway, and water, with a view to determining the service for which each type of carrier is especially fitted;

2. The extent to which right-of-way or other transportation facilities and special services have been provided from public funds for the use of each of the three types of carriers; and

3. The extent to which taxes are imposed upon such carriers by the Federal, State, and local governments.

Upon the basis of its studies, the Board of Investigation is charged with preparing reports for the President and the Congress on its findings and recommendations, and its final report, unless the President extends the time limit, must be submitted by September 1942.

Both these developments provide the background for new approaches to detailed surveys and planning for transportation facilities. By delineating the critical points of over-all Federal transportation policy and showing the interrelationship among the policies of the various transport agencies, these studies will unquestionably induce changes in current survey and planning procedures. To the extent that these changes are directed toward a more integrated planning policy for transportation, they represent a distinct advance.

Of equal importance, but of a different nature from the long-range planning of new transportation works, is the planning work now conducted by the Transportation Division of the Office for Emergency Management<sup>17</sup> for the most efficient utilization of existing transport facilities in the interest of national defense. In the field of rail transportation, the Transportation Division has arranged for a weekly check by the Association of American Railroads of equipment available at all defense centers; and on the basis of the data acquired, plans, in cooperation with the Railroad Association, for any changes required in the distribution of rolling stock. In the field of motor transportation, the Commissioner of Transportation has appointed a Central Motor Transportation Committee and 16 regional committees, whose members represent the public, agriculture, and private and for-hire carriers, to formulate and execute plans for the efficient and economic use of highways and commercial motor vehicles in the interest of national defense. To supply adequate information for planning the use of commercial motor vehicles, the Transportation Division organized a survey of all busses

and trucks available in the country. In the field of inland water transportation, a complete survey has been made by the Transportation Division of the equipment available on the Mississippi-Ohio-Missouri River System, the Intracoastal Canal, and the Warrior River System. In the field of warehousing, the Transportation Division has arranged for the conduct of a complete census of merchandise warehouses by the Census Bureau, of cold-storage warehouses by the Agriculture Department, and of available empty buildings by the warehouse associations.

The procedure adopted by the Transportation Division of using several Government agencies and trade associations in the conduct of its work represents a new approach in planning for the use of existing transportation facilities.

#### Rivers and Harbors

International planning for the use and control of the Nation's water resources is not new. Cooperative planning between the Mexican and the United States Governments along our southern border has been going forward for years. But such international planning on a considerably enhanced scale along the St. Lawrence River has overshadowed all similar efforts during the past year.

In October 1940 the President appointed a United States St. Lawrence Advisory Committee.<sup>18</sup> It is the duty of this Committee to advise the President in planning the work on the project; to cooperate with appropriate agencies of the Canadian Government; and to supervise the preliminary investigations conducted by the Federal Power Commission and Corps of Engineers with respect to the development of navigation and hydroelectric power in the International Rapids Section of the St. Lawrence River. Coincident with the creation of this Advisory Committee, the President allocated \$1,000,000 of his special defense funds to the Federal Power Commission and the Corps of Engineers for preliminary investigations of potential dam sites, preliminary surveys of lands necessary for the development, and preparation of preliminary plans and specifications.<sup>19</sup>

To cooperate with the United States Advisory Committee, the Canadian Government has created the Canadian Temporary Great Lakes-St. Lawrence Basin Committee, consisting of representatives of the Dominion and Quebec governments. The two committees have held joint meetings to facilitate cooperative planning of the international project.

<sup>16</sup> Public, Nos. 247, 353, 77th Cong.

<sup>17</sup> The Transportation Division was first set up as a unit of the Advisory Commission to the Council of National Defense. It was coordinated through the Office for Emergency Management by administrative order on January 7, 1941. Subsequent to the preparation of this report there was established in the Office for Emergency Management the Office of Defense Transportation to "coordinate the transportation policies and activities" of Federal Agencies.

<sup>18</sup> Executive Order No. 8568, October 16, 1940. The Committee consists of Leland Olds, Chairman of the Federal Power Commission, as chairman; A. A. Berle, Assistant Secretary of State; Brig. Gen. Thomas M. Robins of the Board of Engineers for Rivers and Harbors, Corps of Engineers, U. S. Army; and Gerald V. Cruise, representative of the Trustees of the Power Authority of the State of New York.

<sup>19</sup> Executive Order No. 8568, October 16, 1940.

As the result of the work of these advisory planning committees, an agreement between the United States and Canada, providing for cooperative development and utilization of the water in the Great Lakes-St. Lawrence River Basin for navigation and power, was transmitted to the Congress by the President on March 21, 1941.<sup>20</sup> The agreement provides for a further joint Canadian-United States planning effort. Article 1 establishes a Great Lakes-St. Lawrence Basin Commission, consisting of not more than 10 members, with each government designating an equal number. The duties of this Commission will be to prepare and recommend general plans and specifications for the construction of works in the International Rapids section, prepare a schedule allocating the construction of these works to the respective governments, approve all contracts, and supervise construction.

The economic aspects of the St. Lawrence project have been investigated by the St. Lawrence Survey, organized in August 1939 by the Secretary of Commerce, at the President's request. The report of the Survey has been completed during the current year and has been published in seven volumes, as follows:

Part I. History of the St. Lawrence Project.

Part II. Shipping Services on the St. Lawrence River.

Part III. Potential Traffic on the St. Lawrence Seaway.

Part IV. The Effect of the St. Lawrence Seaway Upon Existing Harbors.

Part V. The St. Lawrence Seaway and Future Transportation Requirements.

Part VI. The Economic Effects of the St. Lawrence Power Project.

Part VII. Summary Report of the St. Lawrence Survey.

In the preparation of the report, the Commerce Department has been assisted by representatives of Federal agencies—State Department, Corps of Engineers, United States Maritime Commission, Work Projects Administration, National Defense Advisory Commission, Federal Power Commission, Tennessee Valley Authority; representatives of State agencies—Power Authority of the State of New York, University of Michigan; and representatives of Canadian interests—General Superintendent of Canals, the Superintending Engineer of the Welland Canal, Canadian Steamship Lines, Ltd., Dominion Bureau of Statistics.

By means of the procedures outlined above, cooperative planning of a project which directly affects many Federal and local agencies and the interests of two nations has been promoted in such a manner as to insure a comprehensive approach to the problems involved.

<sup>20</sup> H. Doc. No. 153, 77th Cong., 1st sess.

## Airports

Developmental programs for public works ordinarily pass through three planning stages before construction begins: (1) Planning the general policy for the type of development concerned; (2) planning a program of projects to carry out the general policy; and (3) detailed site planning and the preparation of engineering designs for the individual projects. The program of airport development for national defense, now being carried out by the Administrator of Civil Aeronautics, is an example of what can be done through application of this planning procedure.

The first planning stage in the airport development program was completed in March 1939, when the Civil Aeronautics Authority transmitted to the Congress an Airport Survey, including recommendations as to the desirability of Federal participation in the construction, improvement, and operation of a national system of airports.<sup>21</sup> The Survey indicated very definitely that expansion in commercial and private aviation was occurring at a rate which already taxed ground facilities, and that an integrated construction program for additional airport facilities was essential to further progress. It set forth a planning policy for the development of these facilities.

The second planning stage was concluded in September 1940, when the Administrator of Civil Aeronautics reported that he had completed the planning of an airport development program contemplating the expenditure of \$558,000,000 for the improvement of approximately 3,904 landing areas in the United States. The program of airport projects was based upon planning studies made by the Civil Aeronautics Administration through its technical experts in the district and regional offices, working in cooperation with other Federal, regional, State, and local aeronautics and planning agencies.

By September 1940, it had become obvious that the airport facilities of the Nation were insufficient to care for the increased air traffic resulting from national defense activities. Consequently, in October 1940, the Congress authorized<sup>22</sup> the construction of 250 public airports and landing areas necessary for national defense, and since that time subsequent appropriations have progressively increased the number of airports to be constructed. Congressional action has been based upon the Civil Aeronautics Administration airport development program, which presented the framework within which airports essential to the national defense might be selected for construction. Any fields so selected are in accord with the long-range development

<sup>21</sup> H. Doc. No. 245, 76th Cong., 1st sess. The Civil Aeronautics Authority had been directed to conduct this Survey by Section 302 (c) of the Civil Aeronautics Act of 1938.

<sup>22</sup> 54 Stat. 1039.

needs for landing facilities as visualized by the Civil Aeronautics Administration.

With Congressional authorization of an airport development program, the third planning stage—selection of sites and preparation of engineering designs—then began. The authorization requires that the airports be selected by the Administrator, “with the approval of a Board composed of the Secretary of War, the Secretary of Navy, and the Secretary of Commerce,” as “necessary for national defense.” In accordance with this directive, there was established the Airport Approval Board, consisting of the three Secretaries. Before a construction project is presented to this Board for final approval, it is necessary to conduct field investigations of proposed locations in order to determine for each project the extent and cost of the work deemed immediately desirable for national defense, whether the site is publicly owned, and whether the political subdivision owning the site is prepared to agree to its public use as an airport and to accept responsibility for maintenance of such improvements as the Federal Government might provide. The Civil Aeronautics Administration, in close cooperation with the War and Navy Departments, selects for field investigation groups of air fields in the Airport Development Program which are desired in the interests of national defense.

The Civil Aeronautics Administration has made a special effort to draw upon the help and cooperation of other interested Federal, regional, State, and local agencies. In some areas of the country this has resulted in segments of the national airport plan being adopted as a regional or State plan.<sup>23</sup> To that extent, airport planning has been correlated with the plans of several levels of government.

### Highways

Changes in highway-planning procedures during the past year have been effected for two general purposes: (1) To make the highway network more useful to the Nation's defense effort; and (2) to provide a framework for highway improvements in the post-war period.

A survey of defense highway needs began in June 1940, when the President requested the Federal Works Administrator to have the Public Roads Administration, in collaboration with the Secretary of War, the Secretary of the Navy, and the Transportation Commissioner of the Advisory Commission to the Council of National Defense, make a survey of highway facilities from the viewpoint of national defense. A report on this survey, which was conducted in cooperation with the departmental and field personnel of the above-mentioned agencies and with the staffs of State highway departments, was submitted to the President in

February 1941.<sup>24</sup> The report contains comprehensive plans for the improvement of strategic and access roads in order to meet national-defense requirements.

Subsequently, the President, upon the basis of the findings in the report, asked the Congress for funds to strengthen key points on the strategic network of highways and to provide access roads to military, naval, and defense industrial establishments. These recommendations formed the general background of the National Defense Highway Act of 1941.<sup>25</sup>

While this legislation was under consideration in the Congress, a procedure was inaugurated for planning access roads. The Public Roads Administration developed a working agreement with the War and Navy Departments whereby the Departments certify a defense area to the Public Roads Administration. The District Engineer of the Public Roads Administration then proceeds, in cooperation with State highway departments, to make a preliminary survey of the roads in the defense area. Upon completion of this survey, the District Engineer calls a local conference of all the government agencies—Federal, State, and municipal—interested in the highway problem. At this conference, the highway needs revealed by the preliminary survey are discussed, and an attempt is made to arrive at commitments for their construction on the part of State, county, and local agencies and the Work Projects Administration. Those projects which cannot be financed by any of these organizations are then given ratings and set up on a list of access roads to be financed by Federal funds made available under the National Defense Highway Act. The detailed plans for projects on this list are immediately prepared, however, by the State highway departments, so that construction can begin promptly upon the provision of funds.

The planning of flight strips at selected locations adjacent to public highways, to be available for the landing and take-off of military and other aircraft, also represents a cooperative effort of the War Department and the Public Roads Administration. The Federal Highway Act of 1940<sup>26</sup> authorized the Roads Administration, in cooperation with State highway departments, to investigate flight-strip needs. The War Department has been working on specifications for these facilities for several years. This year the experience and knowledge of the two agencies have been brought together in the formulation of plans for the actual construction of roadside landing areas, now authorized by the National Defense Highway Act.

Looking now toward undertakings of value in the post-war period, the Public Roads Administration has been

<sup>23</sup> Cf. *An Airport System Plan for Wisconsin*, Bull. No. 11, Wisconsin State Planning Board, October, 1940.

<sup>24</sup> Public Roads Administration, *Highways for the National Defense*, in Appendix to hearings of the House Committee on Roads on the Defense Highway Act of 1941, 77th Cong., 1st sess., pp. 217-260.

<sup>25</sup> Public, No. 295, 77th Cong.

<sup>26</sup> Public, No. 780, 76th Cong.

concerned with the planning of interregional express highways. To fulfill a Congressional directive, the Public Roads Administration, as early as April 1939, submitted to the President, for transmittal to Congress, a report on: (1) The feasibility of a system of transcontinental toll roads, and (2) a master plan for free highway development.<sup>27</sup> On the basis of this tentative and preliminary report there has been developed during the last year, within the Division of Highway Transport of the Public Roads Administration, a more comprehensive survey of a special system of direct interregional highways. In this survey a tentatively defined interregional system is located, and the needs of the system are discussed. Design standards are given and cost estimates are quoted on both a long-term and an emergency program. The distribution of the system in geographic regions is analyzed, and preliminary indications of the use, operating costs, and earning capacity of the system are developed.

In order to "permit us upon the conclusion of our defense program to utilize some of the manpower and industrial capacity then available to construct a national system of interregional highways," the President on April 14, 1941, appointed a National Interregional Highway Committee "to review existing data and surveys" and to report to him on "a limited system of national highways designed to provide a basis for improved interregional transportation." This Committee, which serves in an advisory capacity to the Federal Works Administrator, consists of the Commissioner of Public Roads, the Chairman of the National Resources Planning Board, and representatives of State and local governments. The Federal Works Agency has supplied the staff. When the recommendations of the Committee are made, it is proposed to prepare detailed plans and specifications of construction to be begun in the post-war period.

The advance planning of post-war improvements to the highway system is not limited to the interregional roads, however. In its Defense Highway report,<sup>28</sup> the Public Roads Administration recommended an appropriation for the making of advance engineering surveys and plans for the future development of the strategic network of highways as well as bypasses around, and extensions through, municipalities and metropolitan areas. This sum was to be prorated to the States and matched by them on the existing Federal aid basis. The Defense Highway Act of 1941 authorizes an appropriation of \$10,000,000 for the preparation of such plans during the continuance of the national emergency.

<sup>27</sup> *Toll Roads and Free Roads*, H. Doc. No. 272, 76th Cong., 1st sess.

<sup>28</sup> *Highways for the National Defense*, op. cit.

## Pipelines

While the regulation of pipelines as common carriers has been a responsibility of the Interstate Commerce Commission, it was not until the past year that the Federal Government took positive action to plan the location of such transport facilities. In July 1941 the Congress enacted legislation to facilitate the construction of interstate petroleum pipelines related to national defense.<sup>29</sup> The Act authorizes (1) the use of the right of eminent domain by private persons undertaking pipeline construction; (2) the advance of funds through agencies of the Federal Government, to private persons undertaking pipeline construction, these advances being subject to repayment; and (3) the construction of pipelines by the Federal Government in the event that it is impracticable for any private person satisfactorily to construct the facilities.

From the planning point of view, however, a significant provision of the Act is that which requires a Presidential proclamation of the necessity for construction of a pipeline for national defense purposes before any of the actions cited above may be initiated. This provision, in effect, calls for careful advance planning on the part of the Executive branch of the Government in the administration of the law before any actual construction can begin. Complete plans and surveys must be filed with, and approved by, the Office of the Petroleum Coordinator for National Defense before the President will issue the required proclamation. The procedures being undertaken to plan the location of these lines for "emergency" conditions may well contribute to techniques of over-all planning for other forms of transport.

## Power Generation and Distribution

Planning for the generation, distribution, and utilization of power during the past year has been directed primarily to the problems of defense production. New procedures and techniques have been developed under the strain of speeding up the Nation's industrial machine for the "all-out" defense and war efforts. It has been necessary to anticipate power requirements and to plan increases in generating capacity considerably in advance of actual needs.

Defense was the keynote of President Roosevelt's letter of June 14, 1940, to the Chairman of the Federal Power Commission, directing the Commission to survey defense power needs in cooperation with other Governmental and private agencies and to work out plans for preventing power shortages. Acting under this directive, the Commission set up a defense power unit

<sup>29</sup> Public, No. 197, 77th Cong.

charged with the specific task of keeping abreast of the country's changing power requirements. The unit was organized into: (1) A Power Requirements Section, with the duty of translating the increases in industrial capacity into terms of the power required to operate the additional facilities; and (2) a Power Supply Section, charged with determining the available generating capacity, either scheduled or under construction, and the additional capacity required as revealed by the analyses of the Power Requirements Section.

A detailed report under the title "Electric Power Requirements and Supply in the United States," first issued in December 1940 and since periodically revised and brought up to date, shows in graphic form and in considerable detail the relation between power requirements and available capacity in the various sections of the country.

Thus, for the first time, continuing procedures have been developed upon which to base Nation-wide plans and programs for power development. As an initial attempt in this direction, the Federal Power Commission, in December 1940 submitted to the Bureau of the Budget and the National Resources Planning Board under the terms of Executive Order No. 8455, a 6-year plan and program for the development of the water-power resources of the country. In presenting this report the Commission emphasized that, while it was submitting "an immediate program for immediate needs" (referring to national defense power requirements which could be filled in part through use of hydroelectric power), the program was also part of a long-range plan for future needs for navigation, flood control, irrigation, recreation, and other purposes, as well as for hydroelectric power.

As the defense program gained momentum, and the possibility of power shortages in certain areas became more clearly defined, there developed a need for an all-inclusive program for expansion of generating capacity, with definite construction schedules based on the ability of the electrical equipment industry to turn out steam and hydro turbines, generators, and related equipment. Such a program was presented to the President by the Chairman of the Federal Power Commission on July 16, 1941.<sup>30</sup> Schedules were drawn up for construction of steam and hydro generating plants by private utilities as well as by the Government. An important feature of the plan was the proposal for advances of funds to power equipment companies by the Reconstruction Finance Corporation to insure continued peak production of turbine and generator units. This second plan is intended to fill in the gaps of the December 1940 plan, by including additional hydro-

electric projects and proposing certain private as well as public action.

Further expansion of the defense program, revealing still greater needs for electric generating capacity, necessitated closer correlation of the power program with other defense activities. To meet this need with respect to the aluminum industry, the Office of Production Management, in cooperation with the Federal Power Commission, conducted a Nation-wide survey of power supplies. On the basis of this survey, and after consultation with the Department of the Interior, the Tennessee Valley Authority, and public and private power agencies, the Office of Production Management in June 1941 recommended specific locations for aluminum plants. Subsequently, in July 1941 a special power unit was set up in the Office of Production Management to handle: (1) power priorities, (2) power production and transmission, and (3) power requirements for all defense activity.

The problem of planning power development in the West has been of special concern to the Department of the Interior, acting through the Bureau of Reclamation and the Bonneville Power Administration. The Department has been faced with the necessity for expanding its power operations to fulfill mounting defense needs, particularly in the Pacific Northwest and the Southwest. In March 1941 the Secretary of the Interior established a Division of Power within his office to supervise all policy and administrative functions of the Department agencies in connection with electric power, and to make investigations, reports, and recommendations on such matters. Since its establishment, the Division has given close attention to the problems of unification of Governmental power administration and integration of activities in areas where the Department's projects are of major importance, as, for example, the Pacific Northwest. From a procedural standpoint, the new Division should prove useful as an administrative instrument for long-range power planning.

In conjunction with the coordination of power activities within the Department of the Interior, the Bureau of Reclamation prepared a long-range power plan for the area west of the Mississippi River.<sup>31</sup> The plan covers a period of 5 years and proposes the addition of approximately 9,000,000 kilowatts of capacity over this period as part of a coordinated plan for the development of the water resources, including irrigation and flood control. Most of the additional capacity would be hydroelectric, although some steam plants are proposed to balance the system. The Bureau is of the opinion that the effectuation of this plan will go

<sup>30</sup> Federal Power Commission, *Report to President on Plan for Adequate Power Supply for National Defense Program*, July 16, 1941, F. P. C. Press Release No. 1637.

<sup>31</sup> The plan was presented to the Senate Subcommittee on Public Lands and Surveys by the Acting Commissioner of Reclamation on September 8, 1941.



far toward meeting the emergency power needs of the defense program and will, in addition, make a permanent contribution through multiple-purpose projects needed for the advancement and stabilization of the West.

The plans proposed by the Bureau of Reclamation and the Federal Power Commission are in large part complementary, but power-planning procedures in the Government have not yet advanced to the point of producing a coordinated power plan and program to guide both public and private installations. Advances in procedures, techniques, and administration are still necessary before this end can be achieved.

### Education, Welfare, and Health

While the Office of Defense Health and Welfare Services has been concentrating its planning efforts on emergency problems in critical defense areas, another planning organization has been set up in the same field to study the long-range problems. Late in August 1941 a Program Planning Committee was established in the Federal Security Agency to give attention to the preparation of post-emergency plans and programs of public works in the fields of public health, education, and recreation. The Committee is not, however, confining its activities to planning for the post-war period. It will operate on a continuing basis, coordinating the plans and programs of the various service units within the Agency. The divisions of the Security Agency represented on the Committee are the Office of Education, Public Health Service, National Youth Administration, Social Security Board, and Civilian Conservation Corps. Also holding positions on the Committee are the Director of Recreation, Director of Research, a representative of the Nutrition Advisory Committee, and the Consultant on Program Planning—all in the Office of the Administrator.

The Committee has been immediately concerned with determining the fields of planning which are of particular interest to the Federal Security Agency. While it will act as a coordinating body for the planning activities of the Agency's various divisions, the actual preparation of long-range programs will be delegated to the action agencies.

The organization of this Committee is an illustration of a method of integrating planning within a major "line" agency. The coordination of intradepartmental and interdepartmental plans which can be achieved through such a device has been demonstrated before. The Office of Land Use Coordination in the Department of Agriculture and the Office of Land Utilization in the Department of the Interior are examples.

### Education

The Office of Education has set up a planning group to cooperate with the Program Planning Committee of the Federal Security Agency in preparing long-term plans for the educational needs of the country. The first task of the group is the preparation of a program of activities and a schedule of public works needs for education in the post-war period. This work is being done in cooperation with the National Resources Planning Board and State and local education departments.

A demonstration of some of the possibilities of such planning and the procedures to be used was given earlier this year in a survey of educational needs in defense areas initiated by the Office of Education at the request of the War and Navy Departments. The Senate Resolution authorizing this survey requested "a full and complete study and investigation of all school facilities at or near navy yards, Army and naval reservations, and bases at which housing programs for defense workers are being carried out or contemplated."<sup>32</sup> The Office broadened the scope of the investigation to cover all local areas affected by defense activities and enlisted the cooperation of State departments of education and various Federal agencies. By utilizing the services of existing State and local educational agencies, the Office was enabled to prepare in less than 2 months a report of conditions and needs.<sup>33</sup>

The short time in which the report was prepared and the lack of definite information regarding housing programs for some defense areas made it impossible to estimate the needs for all such areas. For this reason, and because school needs constantly change as new defense installations are planned, the survey has become a continuous operation of the Office of Education. Field investigators are cooperating with State departments of education in reviewing needs and reevaluating specific school projects. There is close cooperation in this activity with the Office of Defense Health and Welfare Services both in the field and in Washington, and with the Defense Public Works Division of the Federal Works Agency in the allotment of Federal funds to local governmental units for defense public works.

### Health

Post-war health needs are being studied by a planning and research committee which was set up within the Public Health Service in September 1941 to determine the long-term requirements for public health facilities. The work consists of preparing plans to

<sup>32</sup> S. Res. No. 324, dated October 9, 1940.

<sup>33</sup> S. Doc. No. 20, 77th Cong. 1st sess., submitted on March 31, 1941.

provide for urban and rural water supplies, sewerage systems, and sewage disposal plants; measures for the alleviation of industrial and mine-waste pollution; hospital and research facilities; and other public health needs. The plans when formulated will be submitted to the National Resources Planning Board for coordination and integration with the plans of other Federal agencies. Recommendations for Federal action will be made through the over-all Program Planning Committee in the Federal Security Agency, which will transmit health, welfare, and security post-war programs to the President and to the Congress at the appropriate time.

Again, as in the case of education planning, possible planning procedures and techniques, suitable for developing long-term health programs, were demonstrated in the reconnaissance surveys conducted by the Public Health Service in areas where the impact of

defense activity has increased public health problems. These surveys revealed needs for additional hospital and community facilities as well as for increased public health services. It was also shown that continuing and more detailed surveys were necessary to obtain a complete picture of the public health needs in areas affected by the emergency. Accordingly, the Public Health Service has continued to make such additional studies through its regional offices.

As in the case of the study of school needs, the survey of health problems has been useful in determining need for defense public works. Procedures have been set up within the Federal Security Agency to enable the Public Health Service to cooperate with the Office of Defense Health and Welfare Services and the Defense Public Works Division of the Federal Works Agency in clearing applications for public health facilities.



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## PART II

### 3. ESTIMATED CONSTRUCTION ACTIVITY IN 1942-43

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One measure of the effectiveness of public works construction in achieving employment stabilization is the annual volume of construction activity in the United States, public and private. To the extent that Federal public works construction, along with other Government aids for public and private construction, is able to maintain or increase that total volume it is performing the role of employment stabilization that the Act of 1931 assigns to it.

The total volume of construction activity during the year and the role that Federal expenditures, grants, loans, and guaranties of loans will play in determining that volume are rendered uncertain by three major considerations:

1. Expenditures that the Federal Government may make in its war effort are subject to change without notice as international conditions may require. Thus, expenditures now planned may be increased, or decreased in the event that the war should suddenly stop, in magnitudes that are not now predictable.

2. The policy announced by the Supply Priorities and Allocations Board early in October 1941 makes it difficult to forecast the volume of expenditures for nondefense construction. Under that Board's policy, no public or private construction projects using critical materials may be started with the benefit of priorities during the emergency unless these projects are either necessary for national defense or are essential to the health and safety of the people. To be sure, insofar as the Federal Government is concerned, new projects in conflict with the SPAB policy are not recommended for construction in the fiscal year 1943; but projects started under previous appropriations have an uncertain fate, and expenditures planned for them during 1943 to meet contractual obligations previously entered into may be curtailed through the lack of priorities or allocations for key materials. However, private builders and State and local governments may be planning to continue the construction of projects now under way or may plan to initiate them during 1942 taking the risk that they can obtain the necessary materials without priorities.

3. It is, of course, possible that the priorities policy referred to above may be implemented further by an allocation of critical materials entering into construction. As matters now stand, nondefense construction operations can proceed with the risk that critical materials can be obtained without priorities. But if an

allocation plan were placed into operation so that all such critical materials were reserved for projects that are either necessary for national defense or are essential to the health and safety of the Nation, all construction operations not falling into these two categories would be stopped.

These factors make very uncertain the currently predicted volume of \$11,250,000,000 of new construction activity during the calendar year 1942. This compares with the estimated volume of \$11,000,000,000 during the calendar year 1941 and \$7,800,000,000 during the calendar year 1940. The total estimated expenditures for new construction in the United States, divided between public and private expenditures, for the period since 1930 are shown in Table 1. A graphic presentation of these data, including the years since 1920, is shown in Figure 1.

The volume of public construction in 1942 will be greater than any time in the past. Federal construction for military, naval, and defense-industrial purposes will be responsible for this enormous increase.

#### The Federal Role

The United States Government's role in the construction industry is fulfilled through its activities as a builder and as a building financier. These activities directly influence the national volume of construction in four different ways: (1) Expenditures made by regular Government departments or by Government corporations for the Federal account, (2) grants-in-aid to State and local governments, (3) loans to non-Federal public agencies, and (4) loans to private agencies and individuals and guaranties of private loans.

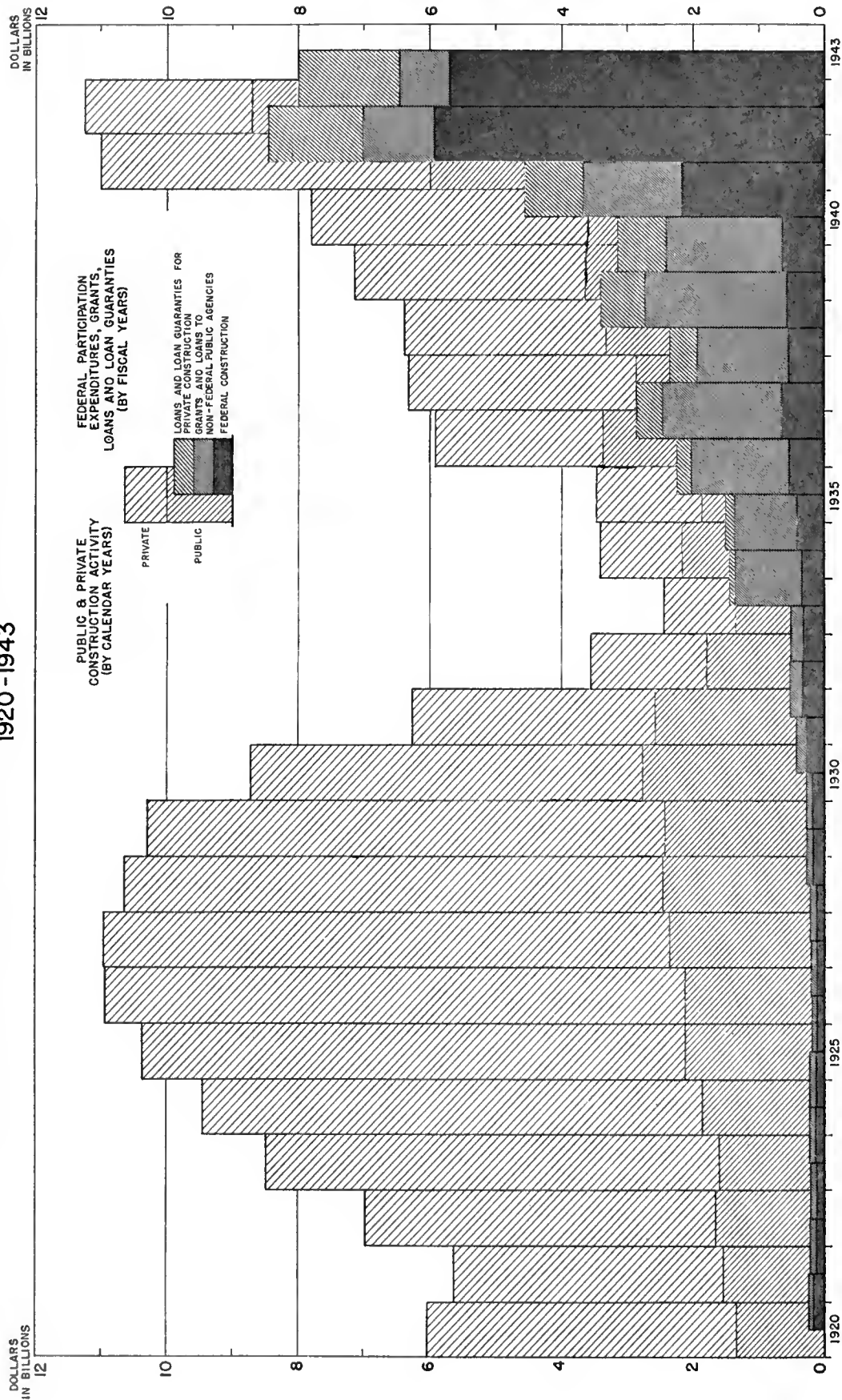
During the fiscal year ending June 30, 1942, upon the basis of current plans, the United States Government's total participation in new construction will total, it is now estimated, approximately \$8,400,000,000.<sup>1</sup> Expenditures will total \$5,900,000,000, while financing, including grants, loans, and guaranties of loans, will approximate \$2,500,000,000.

For the fiscal year ending June 30, 1943, upon the basis of expenditures or financing as recommended in the Budget of the United States Government,<sup>1</sup> the Government's total participation in new construction

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<sup>1</sup> Expenditures for construction by Government agencies for the Federal account are listed directly in the Budget. For Federal financing, some of the actual amounts of expenditures are listed in the Budget. In other cases, the estimated Federal share is determined from the Budget estimates of the administrative expenses required for administering corporation funds which are not appropriated from the general fund of the Treasury.

# ESTIMATED VOLUME OF NEW CONSTRUCTION ACTIVITY IN THE UNITED STATES, AND FEDERAL EXPENDITURES FOR AND FINANCING OF NEW CONSTRUCTION 1920-1943



PREPARED IN OFFICE OF THE NATIONAL RESOURCES PLANNING BOARD

FIG. 1

will total approximately \$8,000,000,000. Expenditures will total \$5,800,000,000, while financing, including grants, loans, and guaranties of loans, will approximate \$2,200,000,000.

In considering the apparent fact that the current estimate of the United States Government's participation in new construction activity will be less in fiscal year 1943 than in 1942, three important factors should be borne in mind:

1. The volume of national defense construction built or financed by the Government will be greater in 1943 than in 1942.

2. Since a great many of the estimated defense expenditures will not occur until late in the fiscal year 1942, i. e. in the late spring and early summer of the calendar year 1942 when construction operations become the heaviest, a small shift in the timing of \$400,000,000 of Federal participation would decrease the 1942 estimate and increase the 1943 estimate correspondingly.

3. Since more of the estimated Federal participation in fiscal year 1942 than in 1943 depends upon (1) the willingness of public or private agencies to assume obligations in the form of loans and loan guaranties, and (2) the absence of a possible tightening of priorities and allocations regulations, the estimates for 1942 are subject to a greater revision in this respect than those for 1943.

For comparison, the accompanying table shows the estimated amount of Federal expenditures for, and the financing of, new construction during the ten fiscal years ending with 1943:<sup>2</sup>

Fiscal year	Federal expenditures for new construction	Federal financing of new construction			Total, Federal expenditures for and financing of new construction
		Grants and loans	Guaranties of loans	Total	
1934.....	\$354,901,000	\$1,090,386,000	.....	\$1,090,386,000	\$1,445,287,000
1935.....	443,197,000	1,060,425,000	\$12,389,000	1,072,814,000	1,516,011,000
1936.....	545,236,000	1,548,426,000	195,412,000	1,743,838,000	2,289,074,000
1937.....	660,908,000	1,821,842,000	399,026,000	2,220,868,000	2,881,776,000
1938.....	564,734,000	1,378,385,000	427,003,000	1,805,388,000	2,370,122,000
1939.....	584,147,000	2,151,341,000	672,954,000	2,824,295,000	3,408,442,000
1940.....	664,114,000	1,760,398,000	702,647,000	2,463,045,000	3,127,159,000
1941.....	2,184,177,000	1,560,432,000	830,229,000	2,399,661,000	4,583,838,000
1942.....	5,881,128,000	1,480,570,000	1,071,500,000	2,552,070,000	8,433,198,000
1943.....	5,817,442,000	1,281,626,000	902,650,000	2,184,276,000	8,001,718,000

The total of \$8,000,000,000 of expenditures for, and financing of, new construction during the fiscal year 1943 is broken down as follows:

1. An expenditure of \$5,800,000,000 for new construction by the construction agencies (Class I) is recommended in the Budget of the United States for

<sup>2</sup> Figures prior to 1942 are actual. Figures for 1942 and 1943 are estimated.

TABLE 1.—Total estimated expenditures for new construction in the United States (1930-42)

[Millions of dollars]

Calendar year	Private construction expenditures	Expenditures for public construction	Total expenditures for construction
1930.....	5,941	2,776	8,717
1931.....	3,712	2,578	6,290
1932.....	1,767	1,794	3,561
1933.....	1,091	1,354	2,445
1934.....	1,232	2,174	3,406
1935.....	1,605	1,875	3,480
1936.....	2,551	3,376	5,927
1937.....	3,443	2,888	6,331
1938.....	3,072	3,323	6,395
1939.....	3,491	3,641	7,132
1940.....	4,183	3,617	7,800
1941.....	<sup>1</sup> 5,000	<sup>2</sup> 6,000	<sup>3</sup> 11,000
1942.....	<sup>1</sup> 2,550	<sup>2</sup> 8,700	<sup>3</sup> 11,250

<sup>1</sup> Including work-relief construction.

<sup>2</sup> Estimated.

<sup>3</sup> Forecast.

the fiscal year 1943.<sup>3</sup> This expenditure represents the estimated cash disbursements by the construction agencies (Class I) during the fiscal year by reason of (1) appropriations that are recommended in the Budget, or (2) the unexpended balances of appropriations made for previous fiscal years that will still be available for expenditure in the fiscal year 1943. In comparison, this expenditure during the fiscal year 1942 is estimated to be about \$5,900,000,000 and during the fiscal year 1941 it was \$2,184,000,000. The large increases during the fiscal years 1942 and 1943 are accounted for by the increase in defense construction.

2. The recommended Federal financing of new construction by means of grants, loans, or guaranties of loans by the construction agencies (Class II)<sup>4</sup> during the fiscal year 1943 is estimated to be \$2,200,000,000. It is recognized that this estimate may be in error to the extent that it depends upon the ability of the prospective recipients of the grants, loans, or guaranties of loans to assume the obligations entailed. The estimate of \$2,200,000,000 for Federal financing is based, however, upon the best estimates of the construction agencies (Class II) concerned.

#### Federal Participation in Total Construction Activity

The accompanying chart (Fig. 1) shows the general relationship between the total volume of construction activity in the United States, public and private, and

<sup>3</sup> Construction agencies (Class I) as defined by Executive Order No. 8455 include those that "plan, initiate, undertake, or engage in construction financed in whole or in part by the Federal Government, by contract, force account, Government plant and hired labor, or other similar procedures."

<sup>4</sup> Construction agencies (Class II) as defined by Executive Order No. 8455 include those that "aid construction activity through grants-in-aid, loans, or other forms of financial assistance or through guaranties from the Federal Government."

Federal expenditures for, and financing of, new construction. As the chart shows, since 1932 Federal activity in financing and making expenditures for construction has shown a strong upward trend to the point where now it accounts for almost 75 percent of the total.

Following the close of the first World War, from 1920 to 1932, the amount of construction affected by Federal Government participation, either direct Federal construction or Federal financial assistance, was a relatively small part of the total, particularly during the first half of that period. During all that time, however, Federal participation was confined to direct expenditures for the Federal Government's own works and grants-in-aid to States for highway construction.

Following 1932, grants-in-aid expenditures were increased in amount and were applied to a wider variety of types of construction, while construction loans were made available to public and private agencies. From 1933 to 1939, the extent of the Federal participation, while increasing in absolute amount, became, following 1936, by reason of the revival of private building, a somewhat smaller proportion of the total volume of construction activity.

Following 1939, however, and the beginning of the defense program, the amount of Federal direct expenditure, by reason of the defense construction, has become an increasingly larger proportion of the total Federal participation, in contrast to the trend after 1932, in which an increasingly larger amount of Federal participation was through grants and loans for non-Federal public construction and the financing of loans and loan guaranties for private construction. Also, the extent of Federal participation has been increasing in both relative and absolute amounts since 1940.

### Purposes of Federal Participation

The accompanying chart (Fig. 2) shows the purposes for which Federal expenditures, grants, loans and guaranties of loans for construction have been made during the last two decades. The broad purpose classifications which are shown in the chart cover the following detailed purposes:

1. *National Defense*.—Includes military camps and cantonments, Army air bases, armories and barracks; naval bases, air stations, navy yards and docks; and defense industrial plants covering Army and naval ordnance and Maritime Commission shipyards.<sup>5</sup>

2. *Land Development and Protection*.—Includes flood

<sup>5</sup> Obviously, other purpose classifications in the chart cover expenditures and financing which are made to aid in the national defense. Flood protection works, power plants and transmission lines, highways, Government office buildings for employees of defense agencies, housing for families of military and naval personnel and defense industrial workers—all of these aid and expedite the national defense. So also do those projects which protect the health and safety of the people. However, for the purposes of the classification used in the chart, a strict interpretation was placed on the term "national defense" and the only expenditures included within that term are the direct military, naval and defense-industrial plant construction expenditures and financing.

control, irrigation, reclamation, forests, national parks, soil conservation, wildlife, and range land conservation.

3. *Promotion of Transportation*.—Includes highways, roads and streets, river and harbor development, canals, aids and assistance to navigation, airports and airways, railroads, docks, terminals, bridges, and other similar structures.

4. *Power Generation and Distribution*.—Includes hydroelectric developments, steam and Diesel plants, transmission lines, and rural electrification development.

5. *Welfare and Health*.—Includes eleemosynary institutions, hospitals, prisons, and community recreational facilities.

6. *Water Supply and Sewerage*.—Includes public water supply and public sewerage and sewage treatment facilities.

7. *Education*.—Includes school, college, and university buildings and plant.

8. *Government Administration*.—Includes Government office buildings, post offices, State, county, and city halls; law enforcement buildings, such as border patrol stations; experiment stations, research stations, laboratories; and construction necessary for surveys and investigations.

9. *Housing*.—Includes public housing and Government-insured private housing.

10. *Miscellaneous*.—Includes types of works and structures not classified above or not classifiable because of the way in which the source data are compiled.

Until very recent years the largest part of the Government's participation in the field of construction activity has been for the purpose of promoting the development and use of transportation facilities. Since the development of the United States has often been termed an "experiment in transportation," it has been natural for the Government to devote a large share of the public works outlays to this field. In recent years, however, the Government has been increasing its financing of housing construction until it is almost as much as that for the provision of transportation facilities. More recently, of course, construction undertaken for the purposes of national defense has expanded both in absolute and relative amounts, so that currently it is the largest single purpose for which Federal expenditures for, and financing of, construction is being made.

As the chart shows, there have been three major trends in the purposes toward which Federal construction activity has been directed since 1921.

First, from 1921 to 1933, about two-thirds of all such Federal activity was for the purposes of providing transportation facilities. Roads and streets, and river and harbor development were the main items in the transportation field.

Second, following 1933, the extension of the grant-in-aid principle to the field of local public works, along with the inauguration of work relief activities in the field of construction, served to diversify the purposes for which Federal expenditures and financing of construction were made. Thus, while expenditures for the

promotion of transportation increased in absolute amount, they declined relative to the total of Federal participation. Construction for other purposes, such as education, welfare and health, was expanded considerably, along with a steady growth in housing construction.

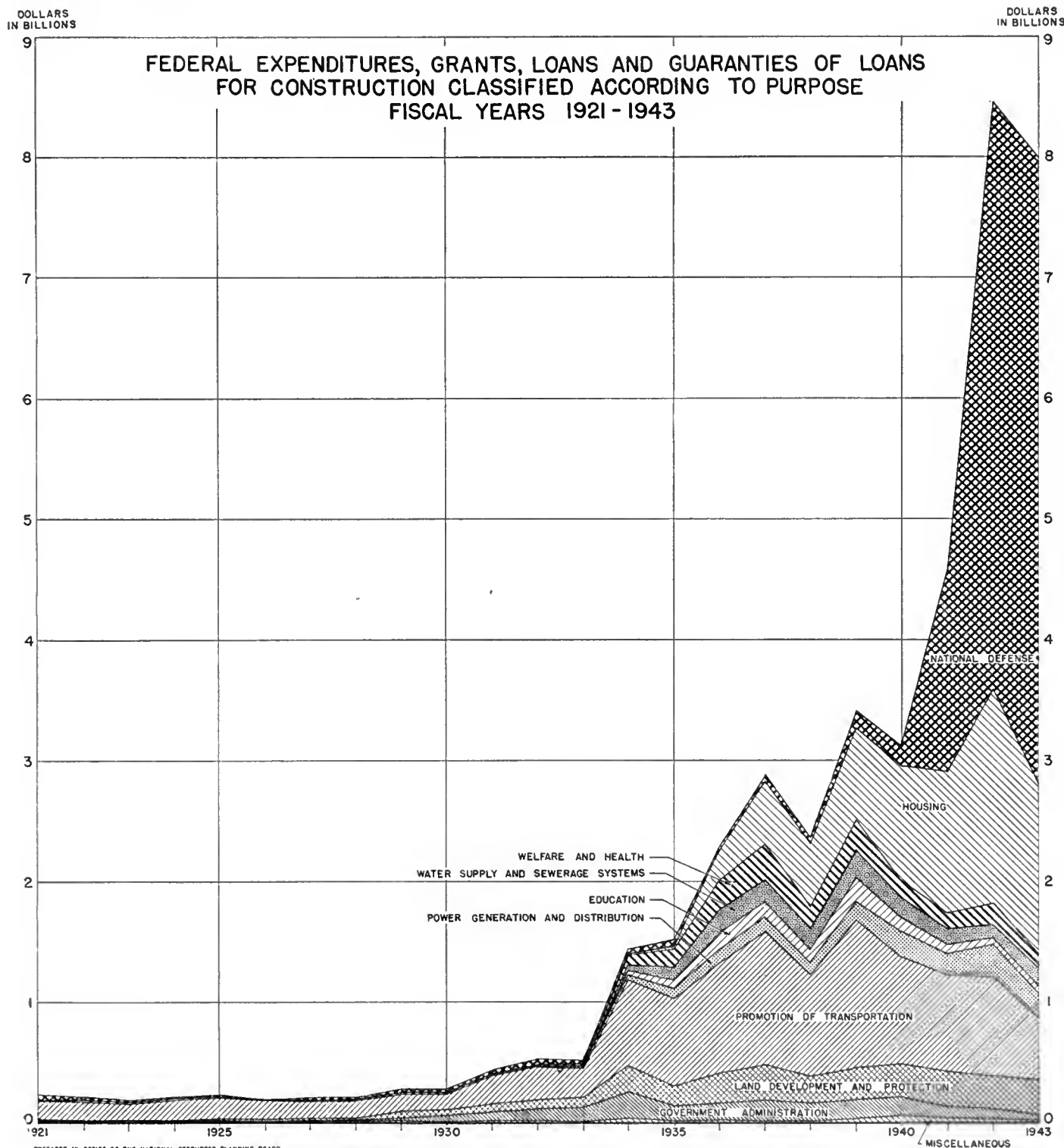


Figure 2

Third, with the inauguration of the defense program in the fiscal year 1940, there has been a steady rise in the volume of construction for national defense purposes, so that now it overshadows all other purposes for which Federal expenditures and financing are being made. Also, in recent years, and even during the defense program, Federal expenditures for and the financing of housing have grown until their volume ranks next to those for national defense purposes.

### The Federal Program

Programming the participation of the Federal Government in construction activities requires a recognition of the fact that the Federal Government is both a builder and a financier of construction. The policy of providing for the planning and programming of the construction activities of the Federal Government was first declared by the Congress in the Employment Stabilization Act of 1931. This Act provides for the advance planning of construction by the agencies of the Federal Government and directs that each construction agency of the Government shall "prepare a 6-year advance plan with estimates showing projects allotted to each year." Also, each construction agency must keep its 6-year plan up-to-date by an annual revision of the plans and estimates for the unexpired years and by annually extending the plans and estimates for an additional year.

In order to bring up-to-date the administration of the Act of 1931 in the light of present conditions, the President, on June 26, 1940, issued Executive Order No. 8455. This order separated the construction agencies of the Government into two groups: (1) In those cases in which the Government acts as a builder, the construction agencies and their activities are designated as "construction agencies (Class I)" by the order; and (2) in those cases in which the Government acts as a financier, the order designates the agencies as "construction agencies (Class II)."

Procedures for making effective the planning and programming activities of the construction agencies (Class I) were set forth in Regulation No. 1, issued under the authority of Executive Order No. 8455. The recommended 6-year program for the construction agencies (Class I) is shown in Tables Nos. I, II, and III, and the accompanying text in Appendix B.

The plans and program of the construction agencies (Class II) are still being formulated. In the meantime, estimates of the volume of construction financing by these agencies during the fiscal year 1943 are shown in Table No. IV and the accompanying text in Appendix B.

Pending formulation of the advance programs by the Federal agencies which act as construction financiers, some estimates can be given of the size of the "shelf" of projects currently available for undertaking in the post-war period, at least insofar as the Government as a builder is concerned. That part of the post-war shelf of projects for which the Federal Government can directly act as the builder currently totals about \$6,250,000,000, made up as follows:

1. Additional expenditures required in the years after the fiscal year 1943 to complete nonmilitary or naval projects under construction in 1943.....	\$1, 500, 000, 000
2. Estimated cost of projects now under survey.....	750, 000, 000
3. Estimated cost of projects upon which surveys are now completed and which await preparation of detailed plans.....	4, 000, 000, 000
Total.....	6, 250, 000, 000

Before the "dirt can fly" on these projects, many of the preliminary plans must be correlated with the other relevant national, regional, State or local development plans in order to eliminate conflicts as to timing, priority, or design, and, finally, but most important of all, detailed plans and specifications must be prepared.



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## PART II

### 4. FEDERAL-AID CONSTRUCTION AGENCIES (CLASS II)

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Executive Order No. 8455 defines a Federal construction agency (Class II) as one which aids "construction activity through grants-in-aid, loans, or other forms of financial assistance or through guaranties from the Federal Government."

After more than a year of experience under Executive Order 8455 in the operation of the reporting system dealing with surveys and projects of Class I Federal construction agencies, the Board is currently engaged in working out understandings with each of the Class II construction agencies covering the detailed manner of submitting their reports to the Board. Owing to the widely differing types of assistance programs operated by the various Class II agencies, it is not feasible to have one reporting procedure which will apply to each of the agencies.

However, these reports will, in general, consist of a statement accompanied by such maps and charts as may be necessary, showing the general plan or program of development for the function for which the agency is responsible. The volume or quantity of work to be done will be shown, as well as the cost, and the statement will be broken down by regions or States.

Each agency is being asked to submit a 6-year program of construction assistance to be revised annually. The program will include a summary statement, showing the amount of the 6-year program and the progress made toward the achievement of the over-all development plan. It will also consist of the aid to construction that the agency expects to propose, and for which funds are desired.

Surveys, investigations, and examinations made by construction agencies (Class II) and directed toward the preparation of any reports, or programs, will be reported from time to time as they occur. In addition, any plans or estimates resulting from the surveys are also to be reported.

This advance reporting of contemplated activities makes possible their review and coordination by the agency and by the Board before they are actually proposed for construction aid in the 6-year program and in Budget estimates.

All formal applications for financial aid through grants, loans, or other forms of financial assistance, as well as reports on the status of construction activities, are to be reported. This information is to be submitted in summary form for the information of the Board, the Bureau of the Budget, and other agencies of the Government having an appropriate interest.

Construction agencies (Class II) are also being asked to require advance planning of projects or construction activity by State or local agencies as a prerequisite toward the obtaining of Federal assistance. Under provisions of the proposed Regulation No. 2 the agencies must demonstrate to the Board that the assistance provided to construction activity shall be extended only to those construction projects which are a part of an advance plan and program of a public or private agency of competent jurisdiction.

The following agencies are considered to have programs falling within the definition of construction agencies (Class II):

1. Federal Works Agency:
  - (a) Public Roads Administration.
  - (b) U. S. Housing Authority.
  - (c) Work Projects Administration.
  - (d) Public Works Administration.
2. Federal Security Agency:
  - (a) Public Health Service.
  - (b) U. S. Office of Education.
  - (c) Director of Recreation.
  - (d) National Youth Administration.
  - (e) Civilian Conservation Corps.

It is anticipated that in the case of the National Youth Administration and the Civilian Conservation Corps, while applications for assistance and the status of construction will be reported in terms of construction activities, the over-all plan of development and the 6-year programs will be reported in terms of the amount and estimated need for employment and training of the Nation's youth. The Civilian Conservation Corps will report as Class II activity only its construction aid program to States and localities. The construction assistance of the Civilian Conservation Corps to other Federal agencies, such as the National Park Service and the Forest Service, will be reported as Class I construction by the respective agencies receiving the aid. The plan of development and 6-year program of the Work Projects Administration will likewise be reported in terms of the estimated extent of unemployment.

3. Federal Loan Agency:
  - (a) Federal Housing Administration.
  - (b) Home Owners' Loan Corporation.
  - (c) Disaster Loan Corporation.
  - (d) Reconstruction Finance Corporation.

The Disaster Loan Corporation obviously has no "6-year program" and will report only applications and



the status of construction. The Reconstruction Finance Corporation will report as Class II construction only the nondefense applications, loans, and status of construction. Its loans to the Defense Plant Corporation, Defense Homes Corporation, etc., are to be regarded as Class I construction activity.

4. Department of Agriculture:

- (a) Rural Electrification Administration.
- (b) Water Facilities Board.
- (c) Farm Credit Administration.
- (d) Farm Security Administration.

The Soil Conservation Service is to report as Class I construction all construction on Federal property for Federal purposes, such as experiment station buildings. All construction assistance to localities, soil conservation districts, etc., is to be reported as Class II activities. In like manner, the Farm Security Administration will consider resettlement projects, migratory labor camps, etc., as Class I construction, and report as Class II activity the Rural Rehabilitation loans and other assistance to local groups.

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## PART II

### 5. PLANNING NON-FEDERAL PROGRAMS

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Authority for the work of the National Resources Planning Board in assisting State and local governments to program their public works is derived from the Employment Stabilization Act of 1931 which declares that it is "the policy of Congress to arrange the construction of public works so far as practicable in such a manner as will assist in the stabilization of industry and employment through the proper timing of such construction, and that to further this object there shall be advance planning, including preparation of detailed construction plans, of public works by the construction agencies and the board." The Act further instructs the Board to "collect information concerning advance construction plans and estimates by States, municipalities, and other public and private agencies which may indicate the probable volume of construction within the United States or which may aid the construction agencies in formulating their advance plans."

In performing the important function of providing public facilities and services, State and local governments are concerned with the construction, maintenance, and operation of "public works" or "public improvements." These include such typical facilities as water supply and sewerage systems, streets, bridges, schools, recreational facilities, fire and police stations, health centers, airports, and buildings to house governmental administrative activities.

The providing of public improvements is important in determining the direction and degree of community development. It frequently involves the expenditure of a sizable portion of the governmental income. Nevertheless, such improvements are too often constructed as unrelated individual items rather than as components of a coordinated plan for the development of public works and facilities for the community or State. Furthermore, with the exception of items financed out of current revenues and included in the regular operating budget, improvements are generally financed by means of individual bond issues or other borrowings, sometimes without proper consideration of the effect upon the present and future financial condition of the State or local government. Such uncoordinated construction of capital improvements is detrimental to the proper physical development of the community or State, and may also result in serious financial difficulties in later years.

For a number of years, the National Resources Planning Board and its predecessor agencies have been working toward a better coordination of the public

works construction carried on by the non-Federal units of Government. One of its early efforts was an attempt in 1935 to ascertain the volume, nature, and location of proposed non-Federal public works throughout the country, by means of a simple listing of projects without reference to manner of financing. A large volume of projects was collected—a volume so great as to indicate that many unnecessary and unsound projects were included. A second listing, undertaken in 1937, attempted to determine the probable extent of local financing for projects. The result was the collection of a much smaller total volume of projects, a circumstance which confirmed the belief that many of the projects listed in 1935 were unsound.

The experience thus gained served to convince the Board that a more complete procedure was required for physical and financial planning of non-Federal public works, if such works were to become useful and needed additions to the State and local physical plant. Consequently, a Public Works Committee was appointed by the Board in January 1939, to undertake further studies of public works problems, to assist in the preparation of a Federal 6-year program of public works, and to encourage State and local governments in preparing similar programs. A number of subcommittees of the Public Works Committee were organized, one of which was assigned to the field of State and local public works programs. Its first efforts were directed toward a study of municipal programming, with the objective of developing a workable method which could be adapted to municipal operation. As a first step, the subcommittee studied the actual experience of cities engaged in programming public works. From officials in Cincinnati, Milwaukee, New York, Richmond, and San Diego, the subcommittee obtained information on the actual application of local programming procedures.

As a next step, a tentative procedure was prepared, and tested in a Nation-wide series of "demonstration studies" undertaken cooperatively with interested municipal officials in Winchester, Mass.; Nashville, Tenn.; Kalamazoo, Mich.; Dallas, Tex.; Fargo, N. Dak.; Sacramento, Calif.; and Spokane, Wash. In most cases, the demonstration studies resulted in the publication by the municipality of a report presenting a long-range program of municipal improvements and recommending procedures for continuance of the programming operation. The experience gained by the Board in directing the demonstration studies was used in preparing a report on the methods and procedures

of long-range planning of municipal public improvements, to serve as a guide for the programming of public works.<sup>1</sup>

Similar studies undertaken on the State level demonstrated that the procedures outlined in the report were equally adaptable to the programming of State capital improvements. While State improvement programs differ somewhat from those of municipalities in the type of projects and nature of the services provided, and statutory provisions may vary, the administrative and financial problems are quite similar. That the public works undertaken by State governments can be programmed to great advantage was clearly proved by the accomplishments of the governments of Maryland, New Hampshire, Virginia, Montana, Idaho, Oregon, and several other States.

The Board sponsored these demonstration studies with the belief that the actual operation of the long-range programming procedure at strategic points throughout the country would cause the procedure to become more widely adopted. Consequently, the operation of demonstration studies by the Board was conducted on a relatively small scale.

Through the demonstration studies, and through analyses of various aspects of past Federal emergency programs, much has been learned concerning the relationship of Federal to State and local public works programs, and the effect of such programs in contributing to the development of resources and the stabilization of employment. It was apparent that the full possibilities of past public works programs in building needed works was not realized, because of the speed with which the programs had to be put into effect. Time was the factor which rendered difficult the preparation of well-planned, coordinated, and integrated programs of public works.

The preparation of advance programs of public works is an effective way of insuring that, in periods of sustained unemployment as well as in normal times, public construction projects will be well planned and soundly conceived, and will make a maximum contribution toward Statewide and community development. Because such programs are prepared in advance, when there is no pressure for the immediate inauguration of a works program, the needs of the State or community can be more carefully appraised. Also, detailed plans and specifications for certain projects in the program can be prepared, and even financial and legal arrangements can be made in advance. The result is a more soundly conceived program better able to meet employment needs on schedule.

The defense emergency has emphasized the importance of the programming operation, particularly

with reference to the post-war period. The war effort is causing a great geographical shift of labor, and an almost equally great shift in the types of occupations. It is reasonably certain that the decrease of war activities may result in serious dislocations of labor and a problem of unemployment. One of the measures which might be used in meeting such an unemployment situation is a program of construction of public works. An important part of the preparedness program for the post-war period would thus be the accumulation of a reservoir of well-designed, carefully conceived, needed, and useful public improvements.

### Public Work Reserve

Until 1940, operations in State and local programming of public works were in the "laboratory" stages. The "pilot plant" stage was reached during 1940 and 1941 when the lessons learned in the demonstration studies were applied in assisting States and cities to program their public works. The necessity for developing a public works program for the post-war period has caused attention to be directed in 1941 to the establishment of a larger scale operation.

To implement this operation, the Federal Works Agency, with the National Resources Planning Board as co-sponsor, established the Public Work Reserve, operating through the Work Projects Administration. The function of the Public Work Reserve is to accumulate and maintain a reservoir of capital improvement projects and public services which might become the basis for a country-wide improvement program. The objectives of this operation are presented in the following statement, which provided the basis for the presidential approval of the establishment of the Public Work Reserve:

I. *Intention.*—In setting up this project, it is intended that a basis be laid for a broad program of work projects that may be prosecuted after the reduction of defense activities. This operation shall be coordinated with the efforts of the Federal Government to provide a 6-year program and to encourage State and local agencies to prepare programs of public works.

II. *Objectives.*—1. To accumulate an immediate listing of needed public projects as a reserve to absorb post-defense or emergency unemployment. These proposals will be collected in two categories:

(a) Construction projects developed at the State and local level.

(b). Nonconstruction projects at the same level.

2. To provide assistance to State and local governmental units in assembling data and in preparing long-range public improvement programs based upon actual need.

3. To relate the State and local programs of Federal agencies with the proposals developed under 1 (a).

4. To assist State and local governmental units to make preliminary studies and surveys for selected important projects.

III. *Scope.*—In securing lists of projects in cooperation with State and local agencies, it is proposed, where possible, to assist in the long-range programming of public works involving com-

<sup>1</sup> "Long-Range Programming of Municipal Public Works," National Resources Planning Board, June 1941.

munity planning, financial analyses, and capital budgets. Where programming in full is not agreed to by the agencies, it is proposed to request a simple listing of contemplated needs.

It is anticipated that where the local community is agreeable to the acceptance of assistance in programming its public improvements that the techniques and procedures developed by the National Resources Planning Board in the demonstration studies in long-range public improvement programming recently undertaken in seven cities will be followed, but that the listing which is accumulated as the first step of the programming procedure will be immediately made available to the Washington Public Work Reserve Office with the consent of the State and local governmental units concerned.

In order that this list may represent the most useful and needed expansions of governmental services, local government officials will be requested to indicate their current judgment as to priority and necessity. The State Directors of the Public Work Reserve and representatives of cooperating Federal agencies will advise and assist in a consulting capacity in procedures for establishing these priorities.

It is proposed that the list of projects will be continuously revised and corrected. As projects are undertaken they will be withdrawn from the list. Conversely, additions to the list shall be made through consultation with proper State and local officials.

Provision should be made for annual review, and, where indicated, revision of lists in order that needs may be constantly evaluated in the light of changing times, needs, and availability of more finished programming. In this manner the list will at all moments represent the well-considered requirements of the community. The choice of projects should at all times be guided by a community plan, where available, showing general needs rather than sectional or selfish benefits and should represent a rounded growth of governmental facilities.

It is intended that the scope of this listing operation shall range over the whole field of public services and benefit, and shall not be restricted to any particular classes of project or department of State and local government.

Even where several years are required for completion, projects will be considered for the reservoir.

Listing will be made available both by types and by geographical areas. For this purpose large programs will be broken down into areas and useful units and included in the appropriate areas and types.

**IV. Preliminary Studies.**—Where justified because of the importance of the projects, it is intended that assistance will be provided to the governmental units to conduct such preliminary studies as will determine in advance such matters as whether to undertake, general character of project, size, location, etc.

**V. Coordination with WPA.**—Although the personnel of the Public Work Reserve are not intended to be an integral part of the State and regional WPA organizations, since their full time must be devoted to carrying out the objectives described above, full use will be made of the experience of the WPA and the cooperating agencies.

**VI. Consultant Relationship of the National Resources Planning Board.**—It is desired that the State and Local Programming Section of the National Resources Planning Board, and the field representatives thereof, shall make available on a consulting basis their experience in the long-range programming of municipal public works and shall have an established and continuing consulting relationship to the project, receiving information and regularly discussing and consulting concerning plans, procedures, and progress, contact with Government agencies, public information, and publicity.

The Public Work Reserve was organized during the summer of 1940 on a Nation-wide basis with a National Director in Washington, and four Regional Field Representatives, each in charge of a specific region. The regions were in turn organized, generally, on a State by State basis, with a State Director in direct charge of individual staffs. Through these staffs, the actual operations are carried on.

Properly planned programs of State and local public works will be of inestimable value in planning for the post-war period, as indications of the Nation's over-all needs for public works and as a basic source from which the most desirable projects might be selected for full preparation, including the actual preparation of construction plans. A proposed amendment to the Employment Stabilization Act of 1931 now before the Congress provides for Federal assistance to State and local governments for the preparation of detailed project plans.<sup>2</sup> Through the assistance which this bill would authorize, and through use of the technical services of Board consultants, State and local governments might be aided in their preparation of worthwhile public works programs, with projects ready for construction when needed.

### Public Works Programming

The adoption of the public works programming procedure by State and local governments throughout the country has been encouraging. At present, 38 States, 260 cities and towns, and over 70 counties have completed, are in the process of completing, or have officially announced the intention of proceeding with the long-range programming of their public works.

The number is constantly increasing and now includes many of the largest communities and most populous States. In addition, many municipalities have continued their initial programming ventures by carrying on the process in succeeding years, thus, in effect permanently adopting a long-range capital budgeting procedure.

Public works programming may be defined as the orderly scheduling of the construction of proposed improvements, based upon relative need and in direct relation to financial resources. Five steps are ordinarily involved in the preparation of the program. Briefly, they are as follows:

1. *Tentative Project Proposals.*—The various planning and operating agencies propose desirable projects and improvements, together with supporting data and cost estimates. The proposed improvements are evaluated in relation to plans for the future development of the

<sup>2</sup> S. 1617, introduced by Senator Wagner of New York. H. R. 5638, introduced by Representative Beiler of New York.

area. Factors which are of importance in this respect are the community's location, area and population, rate of growth, and economic, industrial, and social resources. Also, the nature of the facilities and services already in existence will affect the planning of improvements. Findings and recommendations based upon planning are thus essential to any programming operation. Nongovernmental organizations and citizens also, upon occasion, propose additional projects. The proposals are then arranged in some order of relative importance, or priority.

2. *The Financial Plan.*—The responsible financial officer of the bureau prepares analyses of the financial resources, including a study of revenues and expenditures, of the effect of additional expenditures upon the tax and financial structure, and of related economic factors. Through a study of past financial data and present and probable future trends, estimates are made of funds to be available for public improvements over the period of the program.

In the analysis of financial resources, due consideration must be given to tax limitations, statutory requirements such as bonding limits, existing governmental fiscal policies, and the attitude of taxpayers and their organizations.

3. *The Program Preparation.*—A central authority or committee reviews and analyzes the financial analysis and tentative project proposals, and prepares a program for a definite period, based upon the priorities assigned to projects and upon financial considerations. The schedule for the first year of the program is recommended as the capital budget for the immediate year to follow.

4. *Consideration by the Governing Body.*—The governing body reviews the program, and accepts or revises the budget message or report which accompanies the program.

5. *Public Acceptance.*—Public hearings may be held during the preparation of the program, or the public may be otherwise kept informed throughout the operation. All major works proposals and suggested financial arrangements are fully explained to the public prior to adoption of the program.

The objective of long-range programming is the orderly provision for public works needs for several years in advance, but provision for annual review, revision, and extension must be included in the programming procedure. When the program is annually reviewed, new projects for which the need has developed during the year can be added, while projects superseded, or for which the need has declined, can be removed, and others can be shifted within the program. An additional year is added to replace the year just completed,

and the revised list of projects is scheduled over the full program period. The schedule for the first year of the new program can again be recommended as the capital budget for the following year. The repetition of this operation every year results in a carefully conceived long-term program always available for use.

The constructive byproducts of public works programming are evident in the increasing interest shown by non-Federal Governmental units in accumulating reserves of cash or credit for the day of need. Already many State and local governments are seeking methods of building up such reserves. Cash reserves, and conditional appropriations which may be administratively set in motion are being considered. Action under existing statutes, even though of a stopgap nature, is being taken. Expedients such as over-appropriations to the sinking fund, and devices to create "working capital" are under consideration. These devices are ostensibly intended to save interest on short-term borrowing against future taxes, but the accumulations seem likely to exceed actual requirements to such an extent that the surpluses can be considered reserves.

Because of the character of taxes usually collected, State finances are responding more quickly to the effects of war and defense spending than are the finances of subordinate units of government, with the result that many States are accumulating substantial surpluses. In more than one instance, the necessity for a post-war program of State public works has been presented to appropriating bodies to support the proposal that taxes should be maintained at the present level and surpluses permitted to grow. Adequate tax collections in good times would do much to prevent the necessity for increased levies in time of depression.

Much interest has been displayed throughout the country in a possible Federal interest-bearing instrument in which such a surplus or reserve might be invested. Many suggestions have been received as to the characteristics of such an instrument, for example, that it might take the form of a security limited to State and local government purchase. As yet, there is little agreement on detail, but prevailing thinking inclines toward a premium for prudent State and local management as a reward for correlating the use of the instrument with Federal unemployment relief efforts. Any extensive use of such an instrument would be one more brake on inflation.

The Board has long recognized the shortcomings of long-range public works programming as it is currently practiced. There is need to integrate and coordinate the city program with those of the county in which it is situated, the State, the region, and the Nation. There is equal need to do likewise in those metropolitan

areas which surround many large cities, where juxtaposition and a community of interest create numerous problems which could best be attacked cooperatively. For example, a sewage disposal plant to serve the entire metropolitan area might be much more effective in remedying stream pollution than a number of smaller installations. Again, proper solution of traffic problems may involve several areas. These and many similar problems remain to be solved before programming can be considered wholly satisfactory.

Steps are now being taken to study the integrated planning of metropolitan areas. Recently the Board has inaugurated a study of the possibilities for concerted action between some 80 governmental units in and around New York City. By specific arrangement with the Public Work Reserve, that agency is establishing the programming procedure in the individual governmental units involved. It is anticipated that when the establishment of the programming operation is completed, the necessary agreements among the various political units will have been secured. There will then remain the problem of resolving conflicts and correlating the individual programs. Although many difficulties will be encountered in this step, there are some encouraging aspects to the situation. As New York City under its charter must program its public works, the largest single unit presents no difficulty from the standpoint of the procedure itself, but there are a number of other large cities and metropolitan counties whose interests must be considered. The principal development from a procedural standpoint which may result will be the method by which the constituent governments are brought into working accord.<sup>3</sup>

The experiment in public works programming on a metropolitan area basis is only one method currently being used in evolving an improved programming procedure. A second method is under trial in the city of Athens, Georgia, where an experimental study now in progress has great potentialities for improving the entire programming technique. The Board has enlisted the cooperation of the Athens Planning Board, the Institute for the Study of Georgia Problems (of the University of Georgia), and the Supervisors of Clarke County in a joint effort at programming public works: an effort which transcends anything of this sort yet sponsored by the Board. The departure from traditional methods is made possible by the full cooperation of the Institute in the preparation of a series of preliminary studies—each study under the direction of an appropriate Institute member—to emphasize the

various aspects of planning which should precede programming. Among the topics to be covered are the following:

- Agricultural Adjustment.
- Finance and Taxation.
- Governmental Organization.
- Health.
- Housing.
- Industrial Plant.
- Land Use.
- Parks, Recreation and Libraries.
- Police and Fire Protection.
- Population.
- Marketing.
- Roads and Streets.
- Schools.
- Social Services and Agencies.
- Transportation and Communication.
- Utilities.
- Natural Resources.

Separate reports are being prepared for each topic, and the entire series will be published with appropriate conclusions and recommendations. Using the series of reports as a background, it is then proposed to prepare a long-range program of public works for the city of Athens and Clarke County.

### Progressive Planning Methods

Much remains to be done, not only to improve the detailed techniques of long-range public works programming, but also to develop workable preliminary study methods to assure that public improvements so programmed are properly selected, designed, and located. A planning process is needed that will quickly provide a basis for the best possible judgment in the preparation or selection of projects, and that can then be refined or substantiated to afford more certain and exact project evaluation.

Such a procedure should enable us to answer questions such as these:

Is the project needed now, or can the need be satisfied by the better use of existing facilities?

Is the need temporary, or will it continue long enough to enable the expenditure to be worth while?

Are there better ways of satisfying the need?

Will the project promote a desirable development of the community or will it distort it?

Will the project complement and not detract from the effectiveness of other present or proposed public works?

<sup>3</sup> See National Resources Board Report, December 1, 1934, p. 64.



Customary procedures for development of what has been called a master plan would postpone the answer to these questions until the completion of elaborate surveys, careful and comprehensive land-use plans, and finally detailed plans. It is noteworthy that up to 1940 only 128 American cities of over 30,000 population had completed this process. Many of them, it may be feared, felt upon the completion of the process that they were finished with planning.

Yet, if we keep in mind the questions at which the process is aimed, it would appear that at least a rough answer can be made fairly quickly by bringing together the facts already available about the community and using the best judgment of informed officials and citizens. As additional factual studies are made, preliminary judgments will be substantiated or modified by later knowledge, and the picture of the community's future will become progressively more detailed. With this approach, we should not be caught without any answer to vital questions. We should soon have some answer; and the longer the time available for planning, the better the answer should be.

Current proposals for a "shelf" of public works projects and for Federal aid to the rebuilding of cities after the war make the progressive planning approach particularly timely; and the National Resources Planning Board has accordingly initiated some demonstrations to test its validity, just as in 1939 it facilitated demonstrations of the long-term programming of public works. Indeed, if progressive planning is woven together with continuously revised capital improvement programming, it may establish the idea that planning, like programming, is a continuous process, not a one-time undertaking that results in a master plan. Pro-

gressive planning should serve first of all as a measuring stick in the appraisal of specific projects which might, for example, be proposed for Federal aid—whether roads, housing, or community facilities. Beyond that, it should serve to generate an integrated series of local projects. In short, it should lead ultimately to a planned and programmed scheme of capital expenditures, public and private, and of services.

These experiments in the application of progressive planning should have wider implications. They should inevitably bring together all present plans for future development by all local governmental bodies—all the cities, towns, and villages constituting the total community, the county, school and other special districts. The judgments and knowledge must come from many sources if the work is to progress quickly and if an over-all picture is to be developed. There must be central leadership, but the person or group in whom the Chief Executive reposes this responsibility must be able to call on city departments and unofficial social and civic agencies both for facts and judgments.

On the other hand, there will be certain basic considerations affecting the future of the community which affect a whole State, region, or section. These factors may already be the subject of study by national, regional, or State agencies. Leaders in local planning should have the results of such thinking before them in facing the future of their community. Progressive planning will thus involve the focusing of all Federal and State information and services bearing upon the planning of the demonstration cities. The experiments should yield results in better understanding of the problems and methods of coordinating such aids both in Washington and in the field.

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## **PART III**

### **FUNCTIONAL DEVELOPMENT POLICIES**

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This part contains a number of statements prepared by special staff groups leading to the development of policy in some fields of national resources. The particular fields covered are those in which the National Resources Planning Board has already done exploration work with the purpose of developing broad outlines of policy framework. Other fields remain to be explored and similar statements developed covering them.

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## PART III—FUNCTIONAL DEVELOPMENT POLICIES

### 1. POLICY CONSIDERATIONS IN INDUSTRIAL LOCATION<sup>1</sup>

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#### War Industry

Since the initiation of the defense program we have been steadily adapting our economy to the production of vast supplies of military equipment. Our formal entry into the war has made the rapid acceleration of this process a paramount necessity. The readjustment of the economy from peacetime to wartime production has gone through several stages. There has been first an effort to use existing facilities for the production of war goods to the fullest possible extent. Next, plants engaged in the manufacture of nonwar goods as, for example, automobile factories, have been converted, to varying degrees, into producers of war goods. Beyond this, a great many existing plants, belonging to either of the two preceding categories, have been enlarged. Finally, a considerable number of new plants have been constructed. To some extent these developments have been in progress concurrently. But, as we have approached full utilization of existing facilities, it has become necessary to resort to an increasing extent to plant extensions and new plant construction. In order to produce the immense volume of war materials which we must have for ourselves and our allies, all these developments will have to be carried much further.

The transition from a peace economy to a full war economy involves in the aggregate extensive shifts in the geographical distribution of industrial activity, stimulated in large measure by governmental action. Such shifts arise even out of the exploitation for war purposes of existing plant facilities. By accepting f. o. b. bids, for example, rather than delivered-price bids the Government has encouraged the production of war goods in plants remote from the required delivery point. In some cases, product specifications have been modified to enlist additional producers. In granting some prime contracts, the Army has urged that a certain share of the orders be farmed out. In these and other ways, subcontracting of orders has encouraged the use of small plants in all sections of the country.

The conversion of existing plants from nonwar to war production has been stimulated by the curtailment of the output of goods for civilian consumption, originally through voluntary agreements between producers and the Government, but more recently through the application of priority ratings or allocation of materials. As a result, there has been a great expansion in war pro-

duction in some areas normally devoted to the making of durable consumer goods. Detroit is the outstanding example. On the other hand, in some areas, plants obliged to curtail nonwar output have not always been able to substitute to a corresponding extent the production of war goods. In many instances it has been impossible to adapt such plants to war production with the consequence that their employees have had to seek work opportunities in war industries, often in other areas. Shifts in the distribution of industrial activity have thus been accompanied to no small extent by movements of population.

But it is through the expansion of plant facilities that the development of a war economy has its major effect on the locational pattern of our industry. This expansion is being undertaken partly by the Government itself and partly by private industry with varying degrees of Federal financial aid. Naturally the influence of the Federal Government on the location of these new facilities is not confined to the selection of sites for Government-owned plants. Through the exercise of its discretion in providing capital assistance, in granting certificates of necessity to allow rapid amortization of investments in munitions production facilities, and in allocating defense orders, the Government is also directly affecting the geographical distribution of most privately-owned defense plants.

Originally, the urgent need for speeding up war production made it desirable to erect new plants as far as possible in places adapted to the manufacture of the required products, but within the limits set by strategic considerations. Most appropriate at that time were areas in which similar manufacturing processes were already carried on, where plant construction was relatively easy, where local labor supply was adequate, and where experienced management was willing and able to assume the additional responsibility.

But when extensions and new plants in the "home areas" of the various industries ran into difficulties of congestion, it became advisable, and often necessary, to spread into relatively unfamiliar territory. Thus regional decentralization with its strategic advantages comes partly as a result of the overcrowding of the more industrialized centers. Unfortunately, noncongested localities, because they are not equipped with the requisite facilities and labor force, are often ill-suited for the development of certain of the more highly specialized machine industries. Thus, the promotion of a policy of decentralization in certain industries, highly desirable

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<sup>1</sup> Prepared under the direction of Assistant Director Ralph J. Watkins by the staff and consultants of the Industrial Location Section.

for social and military reasons, is in certain regions impeded by the lack of industrial experience. An area having machine skills and industrial facilities for making needed war materials may be already overburdened with war activity; whereas an area with large, adaptable labor reserves may be blocked from participation because of the lack of experience in manufacturing operations.

The plant expansion program has already led to the construction of industrial facilities outside the industrial Northeast. Between November 1940 and October 1941 a large number of important plants were established, well to the south and west of the major manufacturing belt.

The expansion of war-plant facilities has already entailed a vast outlay. The amount expended from July 1, 1940, to October 1, 1941, reached nearly 5 billion dollars. Of this amount approximately \$3,000,000,000 was provided by the Government for the construction of plants to be operated either by the Government or by private concerns, about \$1,500,000,000 directly by private industry for facilities for which the Government granted certificates of necessity, and \$500,000,000 by the British Government.

#### Objectives of War Plant Location

Next to the military requirements of speed and protection, the main objectives in locating war plants are regional dispersion and local diversification. It is clearly desirable to distribute these new facilities throughout the country in accordance with the location of the major available industrial requirements for their efficient operation and to place them where they can most effectively contribute to a diversification of the local economy. If these aims are kept in mind, then the problems involved in a return to a peacetime economy will be less serious.

Efforts to distribute new facilities in relation to the supply of labor, reduce the necessity for workers to migrate from one part of the country to another. Moreover, by spreading out new expansion, key production areas will experience less of a boom and other less congested areas may sustain a smaller cut in employment and production. By reducing in this manner the impact of the war boom on local industry, post-war readjustments will on the average be less severe. In addition, the scattering of new production will probably facilitate conversion of war plants to peacetime operations. In some instances an integration of military and civilian production can be dovetailed. In fact, one of the major objectives of war plant location should be the alleviation of unemployment in civilian industries resulting from scarcities of materials and supplies.

If each proposal for new war production facilities is tested in the light of availability of labor, power, mate-

rials, transportation, and other production requirements as well as in the light of the ability of local communities to absorb the new activity without difficulty, it is possible to work toward a distribution of industrial facilities, which will further the above objectives.

In reviewing proposals for new industrial facilities submitted by the Army and Navy to the Plant Site Board of the Office of Production Management and referred by that Board to the National Resources Planning Board, the Industrial Location Section has set up the following criteria by which to check the appropriateness of the proposed location.

#### *Criteria Applicable to Suggested Locations for War Plants*

1. *Land:*
  - a. Does the proposed site provide sufficient and suitable land for buildings and for protective purposes?
  - b. Is the proposed site free from flood danger?
  - c. Can less expensive land be used?
  - d. Is the proposal in line with the best land use? For example, does it withdraw good agricultural land from production?
  - e. Is the drainage satisfactory?
2. *Labor:*
  - a. What is the labor supply in the area?
  - b. What skills are required, and are they likely to be available?
  - c. What are the estimated future labor requirements of the area?
  - d. Does the proposal make best use of the local labor reserve in terms of skill, sex, and age groups?
  - e. Are there training facilities or programs in operation?
  - f. Is the project to be located in an area suffering from priorities unemployment, or can it be transferred to such an area?
3. *Power:*
  - a. Is the electric power generating capacity sufficient to care for the additional load?
  - b. Will the project entail additions to capacity not now planned for?
  - c. Does the power system have interconnections enabling it to deliver additional power?
  - d. Are there other appropriate areas with larger power reserves?
4. *Water:*
  - a. What is the amount of available surface and ground water?
  - b. What is the quality and temperature of the water?
5. *Fuel:*
  - a. Is the required supply of fuel readily available?
  - b. What is the cost of transporting the fuel to this location, as compared to alternative sites?
  - c. Are there possibilities of substituting fuels, for example, coal for fuel oil or for natural gas?
6. *Source of Raw Materials and Destination of Product:*
  - a. Is the proposed location advantageous with respect to sources of raw materials?
  - b. How far must the product be shipped for use or further processing?
7. *Transportation:*
  - a. What is the volume of materials shipped into the plant and the volume of products shipped out?
  - b. What types of transportation may be used?
  - c. What transport facilities are available at the site? Is more than one railroad available?
  - d. Do transportation costs of raw materials and finished products, if these are in large quantities, compare favorably with those of alternative locations?

e. Are both rail and water transport available in the event of acute shortages in one of these means of transport?

f. Are access roads adequate?

8. *Housing:*

a. How many laborers are likely to come into the area?

b. Is the local housing supply adequate for the estimated needs? What are the vacancies?

c. Is new housing being constructed?

d. Is there space for new housing within reasonable distance of the plant?

9. *Community Facilities:*

a. Will additional streets, schools, playgrounds, sewerage systems and so forth be necessary? If so, what is the cost, and how does it compare with the cost of the plant expansion?

10. *Strategic Considerations:*

a. Is the location within the strategic defense zone?

b. If outside this zone, is it feasible to change the location or are there other factors making this impracticable?

c. For plants manufacturing explosives, is the site a safe distance from settled communities?

11. *Alternative Locations for the Proposed Expansion:*

a. Is the area already congested with war activity?

b. Is the requirement for additional production so immediate as to necessitate expansion in a congested area, or is it possible to build a new plant in another area?

c. What are the areas not yet congested by war activity, or those having few plant expansions and supply contracts?

d. What are the areas known to be suffering from chronic unemployment?

e. What are the areas affected by priorities unemployment?

12. *Alternative Facilities:*

a. Are there present suppliers of the material who are in better position to expand production because of the availability of resources in their area?

b. Are there idle facilities available as a result of shutdowns enforced by priorities?

c. Can existing facilities be converted to war production?

13. *Post-war Readjustment:*

a. Is this location economic for postwar operation?

b. Are there good conversion possibilities at the proposed site?

c. What will be the local effects of shutting down the plant?

#### Locational Trends and Post-war Readjustments

Prior to the war, manufacturing was tending to become increasingly suburbanized. This trend has continued, for even under emergency conditions, the aim of many private concerns in locating a plant has still been to get close enough to a city to tap its metropolitan labor market and share its transportation facilities and privileges, and yet remain far enough on the outskirts to have cheap land and lower taxes.

Furthermore, the areas outside the industrial North-east where the concentration of war production has been greatest are also in the main those areas which were experiencing a marked industrial expansion before the emergency. Thus, the war effort has strengthened the move toward industrialization in the Texas Gulf Coast, Tennessee Valley, and Southern California areas.

The pre-war trends towards the suburbanization of manufacturing and the industrialization of certain new areas were accompanied by the establishment of industrial plants here and there in places apart from

the main centers of industrial growth. To some degree this tendency toward dispersion has been continued during the emergency period.

Indeed, because of existing congestion within established industrial areas, many cities are now acquiring large manufacturing plants for the first time and they may be expected to exert every effort to retain them.

In general, considering the uneven impact of the defense program upon different industries, it is remarkable how close a correspondence there is between the past moves toward a geographic redistribution of manufacturing and what promise to be the future trends as shaped by the war program. In the main, the process has simply been accelerated.

The pattern of production after the war will depend on military policies, conversion of physical equipment, and the new structure of consumer wants. A number of the new war plants will, in all probability, be retained for defense production after the war. Some plants, for example, explosives plants, will doubtless be found unsuitable for the production of nonwar goods, but the greater the extent to which the new plant facilities constructed during the war period can be adapted to peace-time operations, the less serious will be the post-war problem of industrial readjustment, and the smaller the extent to which the geographical pattern of industry will again be changed.

Naturally the individual businessman will search out peacetime products which can be made by armament facilities and he may also anticipate changes in demand for various types of commodities. Under ordinary circumstances, his own interests will lead him to anticipate developments affecting the profitability of his location. Thus, he can be trusted to shift his operations in line with changes in efficiency. But broad readjustments required by a change from a wartime to a peacetime economy involve basic social problems which require public leadership for their solution. At all times, it is a public task to evaluate and direct broad changes in the regional structure of industry, with a view to protecting the major elements of the public interest.

Preparation for the return to a peacetime economy requires that government estimate the likely decrease in production in each major war industry, study alternative uses to which war plants can be put, and promote the development of industries to which employees in war industries can be transferred.

#### Peacetime Industry

##### The Need for Long-Run Public Policy

It is obvious that public direction of the location of industrial facilities is essential in conditions of war and post-war readjustment. Indeed, at all times, it should be recognized that Government has a direct respon-

sibility in guiding changes in the geographical pattern of industrial activity. These changes profoundly influence: (1) the immediate environment within which our population must live and work, (2) regional living standards, and (3) the welfare of the entire Nation.

A wholly desirable pattern is not to be expected either from the unrestricted exercise of private business choice or from merely indirect and incidental intervention by government. In fact, the location of industries in their most suitable relation to production requirements and markets is in practice among the least automatic of economic adjustments. A large number of interrelated factors are involved in any locational decision, and often a private concern is not equipped with the information or the resources necessary to a fully satisfactory selection, even for the long-run interests of the concern itself.

The social consequences of locational decisions, moreover, extend far beyond the immediate range of interest of the private concerns directly involved. At the local level, the disparity between private and social interest has long been recognized in zoning and other directive legislation. But the disparity is no less significant at the regional and national levels. Over-rapid depletion of the resources in one region may be paralleled by inadequate utilization in another. The sacrifice of long-range wisdom to short-run expediency may easily lead to the twin evils of roaring boom towns and stranded communities. Costs of migration often fall wholly on the migrants or the community at large; they are not sufficiently weighed in the process of private locational choice. The consequent maladjustments between population and industry hinder the achievement of full employment, waste human and natural resources, and lower the level of living attainable by the Nation as a whole.

Government already exercises in some industries a considerable influence on industrial location. Not merely local zoning ordinances consciously directed toward that goal, but also regulation of transportation, power policy, tariffs and other taxes, labor policy, agricultural policy, public works, subsidies, and other phases of governmental programs play a part in determining the relative attractiveness to industry of various localities. Local, State, and Federal Governments all participate in this process. Under current emergency conditions, the influence of government in this realm becomes enormously expanded, and the location of defense plants receives the careful attention of agencies specially established for that purpose. In normal circumstances, however, governmental influence on industrial location has been with few exceptions either the incidental byproduct of policies directed primarily toward other objectives or the result of unrelated local efforts to attract industry regardless of the effects on other

communities. The basic public interest in industrial location demands a reappraisal of past and prospective locational factors and trends, and the formulation and implementation of a conscious social policy seeking to obtain the best possible adjustment between our citizens and their resources.

#### Objectives of Public Policy

A sound industrial location policy will recognize that no final adjustment is possible among population, resources, and industrial plants. Our economy is and must remain a dynamic one. Continuing changes will be necessary in industrial location as in other economic arrangements if we are to avoid stagnation. At times, such adjustments will inevitably require alterations in the distribution of population. One task of public policy should be to facilitate migration insofar as it leads to long-range betterment of economic opportunities and higher levels of living.

The fundamental elements of public interest in this field spring from the opportunity of furthering the national welfare, first through improved efficiency in the organization of production, second through the optimum long-run utilization of resources, and third through promotion of a healthier social environment for work and living. There is also a clear public interest in restraining shifts of short duration which fail to take adequate account of the social costs involved, in accelerating desirable long-run readjustments, in promoting the judicious exploitation of untapped regional resources, and in seeking a more nearly equal regional distribution of economic opportunity. It is by these primary touchstones that specific locational policies must be measured.

In discharging its responsibilities in the development of industry, Government should pursue the following major objectives:

(1) Achievement of the highest possible national income through encouraging specialization and healthy interregional trade based on the natural long-run advantages of each region:

(2) Promotion of conservation of natural resources and their balanced use among regions in order to avoid overexploitation in some areas and consequent stranding of populations:

(3) Development of resources and industrial opportunities in regions with relatively low living standards, without providing permanent subsidies which discourage the movement of population to areas of greater economic opportunity;

(4) Stabilization of employment and production within each region by improving the local industrial structure, especially by developing economically sound new industries to replace declining industries and in general to strengthen depressed areas;



(5) Minimization of short-run regional fluctuations in industrial activity in order to reduce the floating migratory population; and

(6) Integration of industrial location policy with local land-use planning, in order to promote a sound living and working environment.

#### Locational Programs and Their Possible Application

Various programs have been proposed in different quarters for the distribution of new industrial activity. Such programs have sought a variety of objectives, among which are: (1) urbanization—the placing of more industry in cities, particularly large cities; (2) ruralization—the encouragement of industrialization in small towns and farming areas; (3) suburbanization—the shifting of plants out of large cities to surrounding communities; (4) delocalization—the breaking up of high concentration of single industries in particular areas; (5) dispersion—the spreading of industrial activity throughout the country more nearly in relation to population or area; (6) diversification—the encouragement of varied local economic structures; and (7) specialization—the concentration of an important part of local resources on the making of products for which the locality possesses superior advantages.

No one of these objectives can be accepted as a sole guide to public policy. This policy must be related to a particular time and a particular place. Under some circumstances one objective may be the best to pursue, while under different circumstances another and apparently diametrically opposite policy may be the most desirable. Rarely indeed, is it likely to prove in the public interest to push any single location program to the extreme. Some combination of objectives will, as a rule, be needed. It is the broad task of public policy to weigh the relative importance of different objectives in relation to a given situation and to develop the location program or programs likely to prove most effective in promoting industrial efficiency, rising standards of living, and healthy interregional relationships.

Formulation of sound policy in so complex a field must be based on careful study of existing locational patterns and trends, of undeveloped regional resources, of the causes of current maladjustments, of incentives and barriers to migration and relocation, and of appropriate agencies and methods of policy implementation. The Industrial Location Section of the National Resources Planning Board is now engaged in such a study, to be published under the title *Industrial Location and National Policy*. While it is still too soon to put forward definite recommendations, certain desirable lines of policy and action may at least be indicated. First, it should be noted that some indus-

tries are restricted in their location to narrowly defined zones or to large areas as such, whereas others are free to locate over a wide range of areas. In the main, only the latter group of industries is subject to broad social direction.

Although the past has witnessed a trend toward urbanization of industry and population, there is no ground for supposing that the continuation of this trend is desirable or inevitable. The role which governmental policy may play in influencing future trends will depend on a careful weighing of the following considerations; the economic characteristics of each industry, including production requirements, efficient size of plant, and relations to other industries; the size of the community under consideration; the economic structure of the region or community; the relation between social needs and economic costs; and the time required to effect modifications of locational patterns.

Naturally, no blanket recommendations for decentralization away from large population centers can be made. Large cities afford the best locations for some industries, especially those benefiting from external economies, such as certain labor skills, a variety of industrial supplies and specialized marketing agencies. In such industries it is usually advantageous for many comparatively small producing units to locate near each other in order to be able to command the services of specialized concerns. Moreover, appropriate forms of light manufacturing near the central sections of large cities may help to check the deterioration of these areas. Often and perhaps in the same metropolitan area, encouragement of suburbanization is the most satisfactory means of relieving congestion with its many attendant disadvantages. Especially where plant units are large and not closely tied to other branches of production, or where plant operations are of a nuisance or hazard nature, industries should be influenced to locate on the peripheries of cities.

Further industrialization of medium-sized cities should be guided by the need for balance among types of activity. Dependence on one industry and particularly on one plant should be avoided in order to minimize the impact of secular, cyclical, or seasonal unemployment. Diversification is an especially appropriate program for medium-sized cities, because, without conscious direction, it is much less likely to develop there than in large cities.

Caution should be exercised in the adoption of measures to attract industry to small towns and rural areas. If a small town is to become dependent on a single industry, it is obviously important that the industry be a stable one. Moreover, wherever possible, industrial activity should be integrated with existing farming or other extractive activity; for example, industries which operate seasonally may offer an oppor-

tunity to those workers who derive an inadequate income from part-time pursuits.

In most metropolitan areas it is desirable to diversify industries with the aim of creating demands for different types of labor in terms of age, skill, and sex and with the further aim of grouping together industries in which employment rises and falls at different times. If left to itself, industry is likely to develop a degree of geographic specialization greater than the social ideal. This is because the benefits of specialization accrue mainly to the producers and are therefore in line with their own economic incentives, whereas the benefits of diversification accrue mainly to the community as a whole, and therefore receive less attention from private quarters. Much the same consideration applies to concentration of economic activity in a particular region. Individual producers sometimes concentrate their operations within a narrow area owing to the convenience for management and to inertia. They often overlook the operating advantages of dispersion and are unlikely to give weight to the social gains in scattering activity among different regions. Thus, both diversification and dispersion are policies involving, under some circumstances, important social advantages which can be realized only by public encouragement.

In promoting a policy of dispersion and balanced regional development, it is of the utmost importance that the economics of geographical specialization based on natural advantages be retained. Public policy, therefore, should look toward the removal of local trade barriers which prevent other areas from competing, which bring about retaliatory restrictions, and which may thereby ultimately injure the whole country. We can take warning here from the ill effects of the multiplication of trade barriers in the international sphere.

The geographic distribution of people and work opportunities should be as nearly similar as possible in order to avoid the unfortunate and often cumulative effects of stranded areas. Some mobility of population is essential in order that the labor supply may be adjusted to long-run regional differences in economic opportunity. There is much to be said, however, in favor of regulation of the rate of change and in many cases of restraining rapid movement. It is clearly inadvisable to attempt to maintain industry at or above previous levels in all areas. A shift of population may be the only way or the most efficient way of avoiding industrial misfits. Where alternative industries cannot be found, it may be necessary to aid in moving out populations, to provide special training programs to adapt the populations to new types of work, and in general to shift the resource-use pattern of the region.

Before an area is considered decadent, however, an attempt should be made to discover new industries that may function efficiently within the area. The probable

degree of permanence in the decline of opportunity in the community is of major significance. Subsidized support of employment in a depressed area may be justified as a transitional measure only if it leads toward an eventual real solution in terms either of community rehabilitation on a self-supporting basis or eventual partial evacuation in accord with decreased opportunities. Subsidization is not justified when the decline in employment opportunity is inevitable, since such a policy may retard mobility and create local vested interests in inefficient production.

The balancing of locational programs and the most suitable means of implementation for public policy remain to be explored. Governmental authority is adequate to the needs. Taxation, tariffs, price regulation, transportation and power regulation, labor legislation, public works, credit control, and financial assistance are all potentially effective instruments which the Federal Government may wield in its efforts to promote the development of a nationally integrated locational structure. States and localities should play important roles in guiding shifts in the locational pattern, in developing regional resources, and in achieving a regional adjustment of industry to these resources.

### General Policy Recommendations

In summary, the following recommendations are suggested as guides toward improved industrial location in the future:

1. Recognition of public responsibility in the field of industrial location both in peace and in war, but particularly at the time of a transition from one type of economy to another.
2. Public advice on the establishment of new production capacity in terms of its contribution toward and stabilization of employment and production and toward development of industrial resources in regions with comparatively low standards of living.
3. Maintenance of a dynamic economy with allowances for regional shifts in production required by changes in industrial processes and by the discovery of new resources.
4. Alleviation of the loss of employment in stranded areas by development of new local industries or by moving workers to areas with growing industries.
5. Encouragement of the allocation to a region of those industries for which local resources are peculiarly appropriate.
6. Assistance in the distribution of new production facilities in relation to unused and underused resources in order to avoid overcongestion in a few areas.
7. Placement of new defense facilities so as to minimize disruption of the normal economy and to facilitate adaptation to peacetime use.

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### PART III

## 2. TRANSPORTATION PROBLEMS AND FUTURE DEVELOPMENT<sup>1</sup>

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The magnitude of the American transportation system provides impressive testimony of the emphasis which the Nation has placed upon the need for transportation service. It is estimated that 20 billion dollars a year is the bill for that service; that nearly a fifth of all investments are in transportation. The great size of the transport and related industries and their importance to national development are sufficient cause to place them in the forefront of those activities meriting extended attention in the post-war era. For it is a significant fact that upon adequate transport facilities as a tool depends the ultimate success of almost every other plan for the post-war period. Transportation developments exert their influence in almost every sector of the economy because the entire structure of modern civilization is based to a large extent upon ability to overcome the obstacles imposed by time and space.

In the early development of our national life, transportation played a significant role, functioning as the instrument that made possible the transformation from a bare subsistence economy to the minute subdivision of labor and specialization of modern industry. First the waterway and the turnpike, later the railroad led the way in opening new territory, enabling the exploitation of natural resources, and promoting a machine industry and mass production, with attendant vast increases in the per capita supply of goods. During most of the period of its development, the railroad offered an important stimulus to heavy industry and the economy as a whole during successive waves of expansion. Following the last World War, however, the automotive industry performed this function, providing much of the stimulus that produced early recovery and a high level of business activity in the twenties. In the post-war era, transportation may again hold its traditional place as a leader in reconstruction and readjustment. The great potentialities in air transport assure it a dominant role, but important work must be undertaken, too, in the highway, railway, and water transport industries.

Today there are numerous defects in the transportation plant and in its operation. They are evident on the one hand in overdevelopment and underdevelopment of facilities, and on the other in failure to utilize to the best advantage the system which we have.

These shortcomings demonstrate the opportunities for worthwhile investment which the transport industries offer; and at the same time they reveal the compelling necessity for such investment to make possible that development of our resources which must be achieved to assure a higher standard of living in the post-war period.

In a nation endowed as ours with technical skill and resources in abundance, the ability to provide a transportation system fully adequate for national development cannot be doubted. Yet failure to realize the improvements in transportation service made possible by modern technology are only too evident in the hazards, congestion, inconveniences, and high costs which typify a large part of transport operations.

Thousands of miles of highways now accommodating heavy volumes of traffic were laid out before the automobile came into common use, and more recent construction has often been designed inadequately for modern traffic density and speed. Where improvements have been made, they have generally been applied to existing rights of way, tortuous and narrow; and financial stringencies, together with legal obstacles and lack of foresight, have encouraged the acceptance of engineering standards which are obsolete. Such practices have led to the existence of large mileages of road rendered inefficient because of weak bridges, narrow pavements, faulty alignment, dangerous obstructions, and other traffic bottlenecks.

Future development of the airways system presents many of the same type of problems. Airports must be enlarged and modernized, fitted with modern traffic control, and with adequate shop and servicing facilities. Improved access to large urban centers is required from most commercial fields. The airways themselves must be modernized to use the latest radio range and other navigation equipment. Since aviation is a rapidly growing industry, however, its problems will present a different aspect from those in other transport fields. Airports must improve in design to match aircraft design, and in numbers to keep pace with the output of a greatly expanded manufacturing industry. Rapid technological progress offers a sharp challenge to those engaged in planning for the future of this industry.

In our coasting and overseas ocean trade we will, in the post-war period, possess a merchant marine of unprecedented size. Many of the new vessels are being built to the most modern designs and promise operating

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<sup>1</sup> Prepared under the direction of Assistant Director, Ralph J. Watkins, by the staff and consultants of the Transportation Section.

economies hitherto unheard of. They represent, however, a heavy invested capital. Consequently, loss of time in port will become more expensive than ever. Post-war planning must include the modernization of our port facilities, the reconstruction or replacement of many existing piers, wharves, and docks, and the installation of modern mechanical handling facilities. American ports have always lagged behind those of other important nations in the latter respect. We cannot afford to perpetuate this error.

Physical requirements involved in the modernization of railroad transportation also present a vast opportunity for investment. Grade revision, heavier rail, realignment of rights-of-way, and modern signal installations are necessary to permit faster and more efficient train operation; and modern lightweight cars and improved locomotives are required to permit the best and most economical service. At the same time, the competitive duplication of railroad facilities suggests the abandonment of unnecessary segments of main lines, and the retirement of many branch railroads is an urgent necessity where such lines are no longer justified by available traffic or the public need. Most important of all, however, is the problem of terminal unification. The greatest opportunity for the railroads lies in the success with which this problem is overcome. In fact, the terminal area constitutes the greatest challenge in the whole field of transportation, including airports, docks, parking areas, and truck loading facilities. So great is this problem that upon plans made now for its bold solution depends not only the future development of transportation, but the future reconstruction of the cities themselves.

In spite of the preponderant role of our cities in the national economy, public action on transportation has been concerned to a disproportionate extent with rural problems. This is demonstrated in transportation by traditional emphasis upon rural highways and railroad line-haul problems, and by the comparative neglect of urban streets and rail terminals. It is demonstrated by the continued indifference to mass transit development, the antiquity of port facilities, the duplication and confusion in railroad freight yards and stations, the difficulties of urban truck loading and passenger car parking, and the lack of modern, conveniently located airports and connections from them to the central district.

The principal challenge of the post-war reconstruction period must inevitably be the rebuilding of the American city. It is in the city and its environs that about half of us live and work and seek recreation; yet it is there also that we find the most widespread demonstration of unsightly development and planless growth. Transportation must play an important role in the task of rebuilding cities, for intimately con-

nected with urban reconstruction is the redesign of the entire transportation pattern to provide the distribution system necessary to make possible an efficient urban organism.

Not only will a desirable reconstruction of the city depend to a principal degree upon the transport system, but solution of the transportation problem will at the same time rest largely on the thoroughness of city reconstruction. For while the motor vehicle has made it possible to escape the old city by leaving successive areas of abandoned homes and businesses, the problem thus created of providing transport facilities over wider areas and greater distances could be largely alleviated by reclaiming urban waste areas close to the center of the city for protected residential development which would not be encroached upon by the dirt and noise of industrial and congested districts. Industry would be located outside the city where it could expand, and where it could be served by freight lines and terminals removed from the inner city. Such a plan would reverse the present converging of freight and passenger traffic in the center of the metropolis, and provide instead for the dispersion of workers from the center out to the industrial district, and the handling of freight at outside terminals. In addition, by a redesign of residential plats it would be possible to eliminate considerable mileage of city streets to permit their use for parks and similar purposes; and motor truck loading and passenger car parking would be accommodated off the street and within the buildings served.

In view of the inadequacies of the present transport plant and the inefficiencies in its operation, and because of the essential role which transportation must assume in the post-war reconstruction of America at a higher level of income, specific steps must be taken now to assure the direction of future transportation developments toward the most desirable modernization of the transport system. Furthermore, the various policy obstacles which at present prevent the technical achievements of which we are capable must be overcome now to make way for a realization of the desired goal. Questions therefore arise as to what technical standards are possible or potential in transport, and how policy might be revised to permit their establishment.

### Rail Transport

Although public attention has been focused principally upon the outstanding technological developments in the newer fields of transport, important advances have also been made on the railroads which hold out the possibility of continuing improvements in service and increased economy in operation. Outstanding among these have been developments in

motive power which are only beginning to find application. New locomotives are showing directly calculable savings ranging from 10 to 20 percent per annum on the investment by reason of the greater utilization possible from the modern steam locomotive, the greatly reduced maintenance costs of new power arising from outstanding developments in design, reduced fuel consumption, and larger hauling capacity at high speeds. Recent experiments with poppet valve gear and revised steam distribution systems give promise of further improvements in the near future.

In late years many roads have placed in service Diesel-electric switching locomotives which enable substantial economies in fuel, servicing, and maintenance expenses. They also achieve a higher degree of availability than equivalent steampower, and have a flexibility in operation that permits more rapid accomplishment of many types of switching work. The Diesel locomotive has not yet proved its economy for freight and passenger road service, except in limited fields. It may be expected, however, that it will preempt most of the long fast runs. Early developments may sufficiently reduce the first cost of Diesel power to permit its economical use over a much wider sphere of service. Meanwhile, further refinements of steam locomotive design may be expected, as well as substantial economies in operating cost.

Despite the increase in average car capacity in the last two decades, car performance has been discouraging. The proportion of deadweight to revenue freight carried has increased substantially. Recent developments in car construction, including the use of various lightweight materials and new methods of assembly, point to the possibility of materially reducing the tare weight of cars of a given capacity. Moreover, the use of these types of construction enables increases in weight-carrying capacity. Fortunately the cost of lightweight cars has been rapidly reduced, and when substantial orders materialize, will undoubtedly be no higher than the cost of construction of conventional cars. Large expansion of productive capacity for these materials during the defense period will cheapen them and promote their post-war use in many civilian industries, for a market must be found to take up these additional capacities.

Large economies formerly resulted from heavy investments in grade reduction and improvement of alignment, intermediate yards, and other facilities. The depression halted this type of improvement, and permanent declines in traffic may render many projects uneconomical. Important opportunities are, however, available for the fuller utilization of existing low-grade lines. Some use of this sort has been made on a cooperative basis, but widespread improvement must apparently await the accomplishment of consolidation on a broad scale.

The requirements of speed in modern transport service have necessitated important adjustments in schedules and operating methods. Wherever possible, freight trains are now run past intermediate yards for long distances and classification is concentrated at strategic points. This adjustment, in addition to changes in traffic volume and characteristics, has altered the distribution of yard service loads. Many yards have been substantially abandoned, while others have increased in importance. Concentration of work in fewer yards enables improved design and the installation of modern devices to expedite yard work and reduce its cost.

The rapid extension of locomotive runs has rendered many engine terminals obsolete and both heavy and running repairs are being concentrated at principal points. This simplifies the problem of modernizing shop facilities. The majority of railroad shops were designed and equipped at least two decades ago. In the meantime, locomotives have grown larger and heavier and have acquired many types of complex special equipment. Large economies are available from the introduction of new machinery at the larger repair points where good utilization for specialized equipment can be obtained.

Commendable progress has been made in maintenance-of-way work in recent years. The rapid introduction of treated ties and heavy rails, the use of new techniques for building up battered rail ends by welding, the rapid adoption of mechanized equipment, and the organization of system rail-laying gangs are indicative of the type of development that is under way. Unfortunately, the carriers have not found it possible to adopt these methods on a universal scale. The most significant recent advance in permanent way has been the development of the welded rail. Present limited experience on a few roads indicates that the use of continuous welded rail in lengths as great as one mile will prove highly successful. The elimination of rail joints through welding avoids end batter and greatly reduces maintenance costs. The railroads have been slow, however, to adopt continuous welded rail. Test sections are in use on several roads, and more extended application may be expected when greater knowledge and experience are available.

The important possibilities which might be expected from extensive railroad coordination and consolidation have been exhaustively explored and estimated on many occasions. Although the accuracy of the estimates is not convincing, there can be no question of the great magnitude of the savings involved. Significant developments in this direction require, however, a high degree of cooperative planning and extended negotiations for the equitable treatment of the various special interests involved. Extensive consolidation along the most efficient lines probably will not be effected except



as a result of Government participation in the planning and execution of the adjustment; and accomplishment of this objective will require detailed consideration now to determine the course of future action.

### Motor Transport

The last two decades have witnessed a phenomenal growth of motor transport operations by passenger car, truck, and bus; and developments in both highway and vehicle design may be expected to continue the progress which has enabled 32 million motor vehicles to capture so significant a place in the society. Important further developments in private passenger car transportation may be expected through the safety, comfort, and economy attainable by improvements in car design. The conventional automobile of today is still but a stage in the evolution from horse and buggy; and the need is not merely for a thoroughly modern automobile, but one which can be owned and operated at a cost far lower than at present. One possible development is the marketing of a small passenger car which will be attractive, economical, and more maneuverable in city traffic. The possibilities of placing automobile engines in the rear, a practice which has been successful in bus design, promises to provide more inside space, greater safety, and considerable economies in material. The use of higher octane gasolines will also permit smaller engines for a given power output, and the development of polarized light for headlights will permit greater night driving comfort and safety. As a result of further streamlining, there is also a possibility that in appearance the automobile of the future will break entirely with the past. Changes which have been impossible because of consumer resistance and the cost of retooling will be highly probable after the war. The current period of restricted passenger car production and the changeover from automobile to defense output will eventually give way to a new beginning in automotive design and production. With extensive output of small private planes, moreover, there will be considerable incentive to design a car which can compete successfully, and which will be economical and properly adapted to the problems of short-run urban transport for which the automobile is peculiarly fitted.

Potential developments in freight haulage by motor truck are also considerable. The use of Diesel engines, with attendant economies in operation, and particularly fuel economies, will mean substantial enhancement of truck performance. Extension of the use of lightweight materials for truck and trailer bodies may be expected to reduce tare weight and increase payload. Interchangeable equipment will furnish further opportunity for coordination with rail, air, and water transport.

Assuming that the motor truck will in most cases continue to share the highway with passenger cars, the future of the truck is intimately related to motor transport as a whole. For this reason there must be a further development in engine power to permit better performance on highway grades in order to reduce the inconvenience to fast traffic which results from the excessive time and space requirements of the larger under-powered vehicle. Public policy with respect to the regulation of sizes and weights of motor vehicles may be expected to trend toward further relaxation and greater uniformity insofar as highway design and traffic conditions will permit. On heavily traveled routes, there will be a further trend toward the separation of passenger and freight traffic by the provision of parkways for the exclusive use of the passenger car.

Bus transportation promises to become an increasing factor in both short- and long-haul transportation. In the city the need for improved mass transportation will undoubtedly result in the further development of fast commuter bus service; and local bus lines will continue to replace the street car. On the long haul, the recent advent of air conditioning, coupled with the introduction of modern design, marks the approach of new standards of comfort for bus passengers. Terminal and station facilities are likewise being continually improved, and the combination of reduced operating and maintenance expenses and better utilization of bus equipment will result in further reduction in bus fares. The use of Diesel fuel or high octane gasoline offer further potential economies.

Just as the post-war period is certain to be the setting for startling changes in motor vehicle design and performance, the fact becomes increasingly evident that highway facilities cannot continue to lag behind developments in the vehicle to the extent that they have in the past. In fact, many of the most important developments in future motor transport economy and service will be of no avail without extensive modernization of the highways themselves. For while the total cost of motor transport is reflected to a preponderant extent in the cost of vehicle operation, these costs in turn are largely dependent upon the type of highway facility provided. It costs more to operate a motor vehicle on poorly surfaced roads than on high type pavement, or in congested traffic rather than on roads of adequate capacity. Gasoline and oil consumption, tire wear, and vehicle repairs are all affected by the type of highway. In addition, large economies in highway maintenance and in the life of the pavement result from the provision of roads which conform to the requirements of traffic density and weight. Enormous economies are possible through the provision of highway capacity sufficient to minimize congestion, and through the proper application of traffic engineering principles



to eliminate unnecessary stops and starts and interferences to the free flow of traffic. In the future there must be a realization of the importance of adequate grade separation structures at busy intersections to minimize delays. Considerable economy can be achieved by such methods of maintaining average traffic speeds as near as possible to maximum. Finally, the separation of opposing traffic lanes, the provision of separate truck and passenger car facilities on congested routes, and the protection of traffic from encroachments of real estate development adjacent to the highway will be essential elements in modern highway design.

Whether it will be possible in a post-war public works program to establish on any large scale the economic design standards now possible in highway construction, and whether these can be incorporated into the transportation structure of our cities are questions which must be answered affirmatively, now, by the revision of legal, financial, and administrative obstacles which will otherwise continue to prevent the realization of modern highway development. Foremost among these obstacles has been the combination of prohibitive costs and legal restrictions which prevent the acquisition of necessary rights-of-way. Failure to obtain sufficient highway widths has been a primary factor in the persistence of obsolete design, in traffic hazards and bottlenecks resulting from ribbon developments, and in obstacles which prevent subsequent increases in capacity. Another factor hindering highway modernization has been the practice of spreading highway expenditures over so large a mileage of roads that in many cases no outstanding improvements have been possible. This error has been accompanied by the continued neglect of urban highway problems and the frequently undue emphasis upon local rural roads. The multiplicity of small and often uneconomic roadbuilding units performing the work has meant further failure to provide adequate facilities on a system basis. These and other problems are of immediate concern if the future development of motor transport is to achieve the far-reaching accomplishments technically possible.

### Water Carriers

Recent years have witnessed rapid advances in the efficiency of operations by water carriers, both in the coasting and foreign services and on the inland waterways. Much of the tonnage in the coastal, intercoastal, and off-shore fleets is of obsolete construction, costly to operate and maintain. New vessels are appearing on some of the services, however. Modern construction with the latest propelling machinery, whether steam or Diesel, enables substantial economies in operation. The new standard designs of the United States Maritime Commission, intended principally for the foreign

trade, are indicating new possibilities in the direction of high speed and cubic capacity with economy of operation.

The all-important terminal operations, however, require speeding up and modernization. Terminal expenses absorb a large portion of water carrier revenues and, as a large portion of vessel expense continues while ships are in port, speed is essential in cargo handling. Moreover, the increasing cost of labor, particularly in general cargo services, is making port operations difficult to support in the coasting trade. Mechanical equipment is available, both on ship and shore, for handling bulk and general cargoes on an economical basis, but little progress has been made in installing such facilities for handling general cargo.

On the inland waterways, barges and towboats of recent construction contain drastic changes from earlier craft. Improved hulls are streamlined to reduce resistance and enable increased speed with the same power; and construction is of electrically welded steel to reduce weight and permit greater cargo capacity. Double screws have been adopted for modern towboats, providing greater maneuverability and greater speed with the same power. The Kort nozzle is said to augment propeller efficiency by 30 percent, and it also increases the effectiveness of the rudders. Finally, the Diesel engine effects fuel economies, increases cruising range, and enables the use of smaller crews.

### Air Transport

Today the startling achievements in air transport are only an indication of the tremendous potentialities of this newest of major transport agencies. In the passenger field the common carrier plane has become successively larger, speedier, and safer; and operating costs on a passenger-mile basis have constantly declined. Unquestionably first class passenger traffic will continue to shift from rail to air at a rapid rate as passenger fare adjustments and safety and convenience factors place the new agency on a more favorable comparative basis. Feeder service to many points which now lack air service will broaden the traffic area from which airlines will draw their business. Passenger air transport by the small private plane is also a field of tremendous potentialities. With mass production methods permitting the development of low cost planes which are safe, inexpensive, and simple to operate, and with increasing programs of pilot training, the setting for extensive use of the private plane after the war will be highly favorable.

In addition to expanding passenger traffic, the time is not far distant when first class mail traffic will move exclusively by air whenever time is saved. Moreover, substantial expansion of the air express business may be expected. The present rate structure is not designed

to attract this type of traffic, but the cost of handling such business can be reduced to a level substantially equivalent to present rail express rates if volume and regularity of movement are attained. A downward adjustment of rates may, therefore, be expected, and in the not too distant future airways may handle most of the parcel and merchandise traffic which requires special dispatch. The advent of this business in volume will presage regular service by large merchandise planes, carrying traffic at much lower cost than is possible with express traffic as now organized. The mail and parcels business will probably be extended to many small communities by means of devices for picking up and discharging traffic while the plane is in motion.

In the more distant future a large movement of freight by air may be anticipated as costs are reduced and volume grows. The surplus of equipment, pilots, and productive capacity at the end of the present emergency will promote vigorous expansion. The first cost of aircraft will be materially reduced, and the expanding volume of traffic will spread overhead over a larger base. A significant factor will be the use of aviation gasoline having very high octane ratings, which will permit the movement of heavier loads over greater distances per unit of fuel than previously possible.

The rapid introduction of innovations in airplane design during recent years leaves no doubt that technological progress will continue in the future, and that flying can be economical and safe. The big problem will be one of providing adequate landing fields to accommodate the expansion of the industry, including private flying, passenger transports, and the development of express and freight hauling. Combined with airport construction will be the task of furnishing adequate connections with other transport media. Transit facilities must be provided to permit easy access to the city in order that the time saved by plane will not be lost at the terminal. Development of shuttle plane service or of planes which can land in small areas will permit the location of airports close to downtown districts.

In addition to the construction of large numbers of airports and smaller landing fields will be the problem of guiding aircraft over the airways, the development of blind landing apparatus, and the solution of difficult traffic congestion problems. An extension of the airways system will require the establishment of large mileages of beacon lights, markers, and communication equipment. These needs, combined with the necessity for a large number of new airports both large and small, and of terminal buildings and hangars, provides a large-scale opportunity for worth-while public investment.

## Conclusions

On the basis of these far-reaching technological possibilities and the vast expansion of current transport requirements, it appears certain that we shall emerge from the war with a highly advanced conception of what constitutes modern transportation. At that time there will be a tremendous number of planes and a vast productive capacity to be converted to nonmilitary uses. The development of plastics and other substitute materials, better fuels, new ship designs, improved transport organization, and greater awareness of the unnecessary legal obstacles to efficient transport service and the present shortcomings of the transport plant will be among the factors which will contribute to a program of modernization. At the same time, idle men, materials, and machines will inevitably mark the transition from war to peace unless a positive plan of public action is in readiness to avert as far as possible the economic dislocations which would normally accompany such change. The setting, then, will be one in which the need for large-scale rebuilding of the transportation system will be simultaneous with the need for a vast program of public works and new capital investment. To overlook the possibilities of such a coincidence would mean a loss not only of labor resources and transportation achievements, but also of the hope that through a rapid change-over to productive new investment we shall be able to prevent the national income from catapulting to the low pre-war levels.

Although avoidance of this possibility depends upon such stimulation of the general economy as will sustain traffic, emphasis is placed upon investment opportunities in the transport industries because of their role in facilitating the operation of the whole post-war program. A general reduction in transport rates will encourage traffic and stimulate consumption, and new transport developments will in turn permit the development of new resources and provide the necessary means to other planning ends. These objectives must be accomplished by the public provisions of terminal and right-of-way facilities adequate to accommodate modern railroad, automotive, and plane equipment; and such action must include the elimination of unnecessary duplicate services, wasteful practices, and a vigorous program of consolidation and coordination. Transport modernization means not only the adoption of new techniques, but also the elimination of obsolete practices.

The need for new transportation equipment to serve post-war requirements will offer considerable opportunities for profitable investment. Railroad and motor-vehicle equipment needs may be magnified beyond previous normal requirements as a result of deterioration resulting from increased utilization during the war and

of restricted replacements due to a limited supply of materials. In addition, the introduction of new types of equipment and the competitive pressures promoting their adoption will probably induce further investment.

In order to serve a twofold purpose, first of furnishing equipment adequate for post-war service; and secondly, of aiding in the provision of new capital investments necessary to maintain a high income level, transport equipment manufacturers now producing tanks, ordnance, etc., must resume their peacetime roles as rapidly as possible. Plans must be laid now for such conversions. In particular, there must be assurance that orders of sufficient magnitude will be placed by the railroad industry for cars and locomotives to make these conversions worthwhile. This raises the possibility that wholesale orders might be made by the Government, during the war, for execution after the war, in conjunction with a plan for sale or lease at that time. This project might be handled through the RFC or a new railroad promotional agency within a Federal transportation authority.

The attitude of the railroads will, of course, depend largely upon their financial position, earning power, and prospective traffic. Present railroad opinion anticipates serious declines in freight and passenger traffic, more severe competition, and inflated wage and cost structures. The carriers will be prepared, therefore, to curtail purchases sharply once the war is terminated. Although financing can undoubtedly be worked out through the RFC, it will be difficult to induce the railroads to lease or purchase equipment unless there is reasonable assurance of a relatively high level of traffic. If the expected post-war decline can be prevented or cut short, the railroads may provide a market for as much as \$500,000,000 worth of new rolling stock per annum. They will not, however, rush in to buy.

The aviation industry offers a better prospect. Concerns are already planning for expansion into the air freight business at the termination of hostilities. Although ex-military equipment will probably be available to them, it appears that new equipment designed specifically for the work to be done will be more economical in the long run. Hence, there will be a large and growing market for commercial planes which will keep a considerable portion of the expanded production facilities busy. The growth of overseas services should be especially rapid. At this stage, however, it is impossible to set any quantities upon the business likely to develop. Financial encouragement on the part of the Government will be a vital necessity, since the industry must expand from a small base.

Future motor vehicle equipment demands will doubtlessly be of considerable magnitude, not only because highway vehicles will be working at high rates of utili-

zation during the war, but because new production on any large scale will be impossible due to shortages of rubber and other materials. In 1940, the wholesale value of motor truck factory sales was approximately \$600,000,000, and automobile wholesale values exceeded \$3,000,000,000. During the past 5 years the value of this equipment has totaled \$15,000,000,000. Wartime stoppage of the normal flow of new vehicles to replace existing stock will therefore create large accumulated demands with each year of restricted production. A long war would mean tremendous replacement requirements.

The wartime ship-building program is likely to result in an excess of vessels and of facilities for building them. Consequently, there would seem to be little opportunity for post-war investments of this sort. Many of the large number of vessels which should be available at that time will probably enter the coastwise and inter-coastal services, so that more traffic may be diverted from the railroads than in the past, a situation which would tend to reduce railroad demands for freight equipment.

So far as transport agencies are concerned, the opportunities for investment in equipment programs are of minor importance compared with those which could reasonably be outlined for expansions and betterments to rights of way and terminals. Replacement of existing scattered and ill-coordinated facilities by modern unified terminals could profitably absorb substantial amounts of capital, but financing would necessarily come chiefly from Government. Plans should be laid now for this type of operation.

If the post-war public works program for transportation is to fulfill the task which is confidently expected of it, it is essential that action be directed now in accordance with specific lines of approach. First, undertakings currently being placed on the list of reserve projects must originate with the principal objective of affording a worthwhile public improvement. Although the post-war public works plan must provide jobs, it does not follow that work is to be considered the end rather than the means of the stabilization program. Secondly, projects for each agency of transport must be properly related to the entire transportation system and to a desirable plan of development for the agency as a whole. Third, there is need for far greater coordination between transport and other public policy than has hitherto been achieved. The two cannot logically be separated. Finally, there must be an immediate removal of existing obstacles to transport modernization which, unless disposed of, will prevent the realization of any real achievement in a public works program.

One of the obstacles which now confronts the public

works program for transport development is the fact that railroad rights-of-way, unlike the basic facilities of other transport agencies, are privately owned. As a result, both the planning of an overall transportation system and the profitable investment of public capital are thwarted; and exclusion of the railroads from a large-scale public works program accentuates the problem of unequal promotional policies, hence of an uneconomic distribution of traffic. There is urgent need, therefore, that all rights-of-way be under public ownership to permit a properly conceived modernization of the transport plant as a whole.

A second important matter which must receive attention now to assure the success of public works undertakings in transportation is that of land acquisition and finance. The problem of securing adequate rights-of-way for highways has grown to critical proportions, and the need for revised legal and financial procedures in this field will be augmented in any attempt to construct and relocate transport terminals. Local units, terminal associations, and other suitable organizations must be organized or expanded to undertake preliminary work, formulate plans, and place machinery in readiness to undertake desirable projects as soon as the emergency is over. An immediate necessity is the creation of a Federal Agency with sufficient funds and legal authority to assist State and local governments now in the acquisition of lands needed for future transport modernization

whenever these governments are unable to obtain reasonably prompt action.

Among other steps which must be taken now to promote post-war accomplishments are those relating to the financial condition of State and local governments and their expenditure policies. Methods should be devised whereby surplus funds now being accumulated might be kept intact to provide additional public works when labor and materials are again available. One possibility is that local units might now write off their road and street bonds to the extent that they are callable; another that current revenues might be used to purchase a special defense bond issue to be terminated when the public works program is to get under way. A third possibility is that real estate needed for future transport undertakings might be purchased now with these surplus revenues.

In conclusion, there is increasing evidence that the role of transportation in the post-war public works program requires the scrutiny of transport projects in the light of the rapid changes now taking place in transport technology; that a far-seeing plan for transport development cannot be possible unless directed from an overall understanding of what the future in transportation can and should be. Such a task is the logical responsibility of a Federal transportation authority which can serve to establish the broad outlines of a transportation objective for America.

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## PART III

### 3. PLANNING FOR UTILIZATION OF SPECIAL SKILLS<sup>1</sup>

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During the 16 months of its existence, the National Roster of Scientific and Specialized Personnel seems definitely to have established that the function which it performs is one which is essential to an effective program of personnel management during an emergency period. While other organizational devices might have been found to meet the exigencies of the emergency personnel situation, the centralization of these various functions into the one organization has been demonstrated as an efficient method of handling a critical need. The segregation and appraisal of the scientific and specialized skills of the Nation's citizenry has permitted a planned approach to a distribution of those skills where they are most needed.

The function of the Roster has been novel in the governmental structure in that it seeks to deal with areas of skills rather than areas of employment. Already existing Federal agencies are designed to deal with various employment areas. One agency is concerned with the recruitment of civilian workers for the Federal Government; another, with the skilled-worker needs of private industry. The military establishments have hitherto largely depended upon their own sources to recruit candidates for commissions. As a result, there has been no one focal point of induction of the scientist or professional man into the civilian and military establishments of the Government and the research laboratories and production plants of private industries and institutions. The segregation and definitive analyses of the Nation's human resources in the sciences seem indispensable to a productive defense effort. Only in this way can these skills be adequately utilized.

The objectives of the National Roster, the recruitment of scientific personnel and the conservation of scientific skills, are being met and the byproducts of the central index are daily becoming more significant. Operating pressures have permitted little research into the wealth of material at hand in the National Roster. Such few studies as have been made, however, have provided interesting and important data in such matters as the potential supply of skilled workers in strategic occupations, the necessity for accelerating training efforts, and the actual reservoir of skills which may be available to the Nation as defense needs develop.

The recruitment of scientists measured in terms of tens of thousands amply shows the role the scientist is playing in a present-day emergency effort. This fact alone suggests that some central index to the skills of the Nation should be available to the central Government not only in an emergency period but in peace time as well.

In a sense, only the first stage in the development of the Roster has now been accomplished. Basic working procedures have been established, fully tested, and shown to be useful and efficient. More than 60,000 names have been supplied to defense agencies for consideration as a result of the analytical use of its files. Records show that of this number many thousands have actually taken up work with the Government as a result of the operations of the Roster. The whole pattern of operation of the Roster has demonstrated itself to be so successful that it is clear that plans must now be made for its continued growth and development.

The future development of the Roster must, it seems, take two general lines. In the first place, as the defense effort becomes more nearly total, the present very real shortages in highly trained manpower in certain fields are bound to be even more acute. This means that the Roster will be called upon in this country to assist in the conversion of specialists from one field to another. This function is now one of the main fields of the British National Register. The growing shortage in engineering and other fields also suggests that the Roster must do everything in its power to make its files in certain areas as complete as possible. In order to do this, new procedures will have to be developed to reach "hidden experts" who are not now listed. Coverage must also be extended to fields which have not yet been canvassed. The importance of conservation and of proper democratic allocation of expert talent is now also becoming greater in the day-to-day operation of the Roster. Every effort must be made to plan wisely in connection with the allocations resulting from the changing demands of the defense effort. This will be even more important as war impinges upon the already all too limited supply of American specialists. In the second place, it is not too early for the Roster to begin to plan to assist in the great problem of the proper reallocation of American experts, once the present emergency is over. This procedure of reallocation at best will be extremely complicated and will be charged

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<sup>1</sup> Part of a Report of the first year's work of the National Roster of Scientific and Specialized Personnel submitted by Leonard Carmichael and Jos. O. O'Brian, Jr., Director and Executive Officer of the Roster.



with the greatest potential danger for the Nation. Is it too early to suggest that if the specially trained scientists and other experts of the Nation have been essential in the defense effort they may also be basically needed in the task of creating a better post-war world? The proper use of man-power in true reconstruction, however, will not come about by chance but must be planned for. This seems to clearly suggest that the Roster should begin now to formulate procedures by means of which it may play its full part in post-war personnel adjustment.

Planning for the post-war period in relation to the Roster should be in two separate but interrelated spheres. In the first place, plans are already being discussed by means of which all highly-trained individuals in the armed forces and other defense agencies, who are subject to demobilization and who are not listed on the Roster, be included at the earliest possible moment so that the Roster procedures may be used as one agency to assist in efficient demobilization and effective post-war personnel placement. In the second place, the Roster should now begin to consider, as suggested above in the section on post-war planning, procedures by means of which the continued use of the Roster may assist in the construction of an effective post-war economic and social order. In this connection especial attention is called to the recommendation given in the section under personnel planning that a conference or series of conferences be called to discuss the relationship between the Roster and the prediction of professional and vocational trends in connection with vocational guidance and personnel planning for post-war America.

### **The Implications of the Roster for National Personnel Planning in Connection With Education and Vocational Guidance**

In a diagrammatically simple and ideal free society, each individual would be performing only those tasks for which he was most completely suited. It is obvious that for many practical reasons this Utopian state of affairs has never been and probably never can be approximated, let alone fully achieved. As a goal, however, the ideal of fully adequate vocational adjustment for all citizens is a very worthy one. For many years it has been the aim of certain educators and employment managers to do what they can to bring about improved vocational guidance for young men and women. These individuals have associated themselves together in what is at times called the vocational guidance movement.

The National Roster is not without certain implications for proper vocational and personnel guidance so

far as the future of our country is concerned. Insofar as such an aim is associated with the Roster, however, one must recognize at the outset what some of the essential limiting factors in human guidance are.

In the first place, the thesis that the bulk of citizens are born with specific patterns of talents which predestine them from the first for only one relatively narrow field of work has never been demonstrated. It is true, there are, within certain limits, probably inherited levels of ability and also there may be some inborn specific aptitudes; but for the most part, vocational guidance must concern itself with the discovery of the capacities of individuals at various levels in the educational ladder and the modifications of these aptitudes and abilities along socially approved lines. These basic psychological and even biological facts must be considered in planning any program of educational and vocational guidance.

Aside from facts of the sort just indicated, however, the great stumbling block in every program of guidance is the fact that in attempting to advise a young man or woman what he should do in life, one is necessarily assuming a role of prophet. The difficulty of guessing concerning the future has led most experts in the field of vocational guidance to adopt two guiding principles: First, for the most part, those who attempt to assist high school or college students in the selection of a vocation ordinarily limit themselves to the provision of information concerning alternative vocations. The decision concerning the field for which the individual may wish to train himself is, in most instances, strictly placed in the hands of the young individual himself. To put this matter in another way, self-guidance on the basis of proper factual evidence is considered to be the most satisfactory procedure in a democratic guidance program. Unfortunately, however, facts concerning the availability of vocational and professional openings in a changing society are very difficult to secure, and so there is a tendency on the part of those charged with guidance activities to attempt to allow general education to continue as long as possible, thus not only providing more citizens with wide basic training but also allowing the individual to alter his vocational choice when new conditions arise. This program is a conservative one, but it has obvious limits, because sometime in the course of each life the final vocational choice must be made, and all too often this choice is determined by the "Boy Wanted" sign rather than by any particular preparation of the individual for this place in society.

Sometime, however, the Utopian state of affairs referred to in an earlier paragraph must be more nearly approximated, if our industrial and technical civilization is to be efficiently organized and if unnecessary human suffering and talent wastage is to be avoided. Preparation for most technical fields, however, demands



years of intensive education, and the suitable direction of this education can only be determined by a knowledge of future society demands. At the present time it is very difficult indeed to give vocational advice that is at once honest, wise, and at the same time specific to an adolescent boy concerning whose talents everything possible is known. If specific advice is to be given, facts must be determined concerning the employment trends of the future.

The work of the National Roster in the present emergency has indirectly shown certain areas in which there is now a serious dearth of trained Americans. If the present emergency were to continue indefinitely, it would be relatively simple, on the basis of facts disclosed by the operation of the Roster, to make rather definite suggestions concerning suitable professional training in America. For example, it would be possible to say that the field of radio physics is one that needs many more graduates than it has received in the past; but if the advice were to be given today to a young man starting upon his higher education: "Study radio physics," a second question would at once present itself. After the emergency is over, will radio physics continue to be a field in which many experts are demanded? Of course, this question and hundreds of others like it can never be fully answered, but it seems possible that by the amassing of facts some suggestion of trends could be secured.

Thus agencies such as the National Resources Planning Board which are directly concerning themselves

with plans for post-war world could well consider plans for the provision of personnel after the war as well as plans for engineering and other developmental programs. It must be recognized, however, that such planning will at once involve the entrance upon highly controversial areas. For example, evidence today indicates that society now needs and probably will continue to need more medical and dental care than it is at the present time securing. There are also many more young men and women competent to study and become proficient in medicine and dentistry than are allowed to prepare themselves for these fields. Here one again meets the familiar economic paradox of a society constituted on traditional American lines. There are wide needs and wide potential resources, but no satisfactory plan for distribution has been worked out.

In view of the foregoing statements, it seems to the officials of the Roster that a carefully formulated series of questions concerning future vocational trends and the possibility of vocational guidance should be drawn up. Once this agenda has been agreed upon in consultation with the National Resources Planning Board, a conference of educators and other individuals interested in human planning might well be brought together. This conference should discuss procedure by means of which more effective assessment of professional and vocational trends could be made so that such information can be made available to those charged with vocational and professional guidance in connection with higher education in America.

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## PART III

### 4. ENERGY, PRODUCTION, AND MANPOWER<sup>1</sup>

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#### **National Policy for Energy Resources and Power Supply**

It is a commonplace to say that a modern industrial economy like that of the United States is founded on mechanical power and energy not derived from muscle. The goods and services required by our 130 million people could not possibly be made by muscle alone. Energy derived from coal, petroleum, natural gas, or water power is fundamental.

#### **Energy, Enterprise, and the People's Needs**

Watt and the steam engine powered the industrial revolution hardly more than a century ago—a century of iron and steel, of railroad building, of exploitation of mineral and forest resources. Nonmuscular energy applied through mineralogy and metallurgy, through modern chemistry, through electricity, and finally through automatic processes can produce enormously greater quantities of goods and services than could be made by muscle, and also goods and services that muscle could not make at all. Modern industrial enterprise and, therefore, commercial initiative are based on mechanical and electrical energy. Among the results are: (1) liberation of the human race from limitations of human and animal muscle and brain, and even in some degree from the limitations of nature's caprice in matters of natural resources and climate; and (2) total war.

Machine power has made possible warfare between whole nations on a continental scale. The question for this generation and the next is whether machine power can be controlled to produce, not warfare, but the goods and the services and the jobs that the people want and need.

#### **Victory: First National Enterprise**

War machines are made by machines from raw materials extracted and processed by machines and the machines are driven by power, from the mine, the forest, and the field to the front line and the panzer spearhead. Nature endowed many nations with rich and abundant resources of power, the United States among them. To make these resources available for total war at the machines where the power is needed will strain our ability and our willingness (1) to produce, (2) to transport or to transmit, (3) to utilize for first purposes first.

No detailed calculations are needed to demonstrate this. War material and the support for modern total warfare are products of a total industrial mobilization. The plants and the men and the power of the United States have never yet been fully mobilized for peace, but now must mobilize them for war. Demands on every factor of production will exceed past limits, not merely past performance. Total output will not only be different in kind but must be larger in amount.

Failures to anticipate and to provide for the sheer magnitude of the new combined demand have already left us without enough plant and materials to mobilize our total strength—steel, aluminum, railway rolling stock, copper, rubber, electric power. Wartime requirements cannot be fully met without curtailment of civilian consumption to a point where, ultimately, the habits of a free industrial economy must be drastically changed and where military production itself may actually be limited. A major task of government will be to safeguard and expand the supply of power for the huge production job that lies ahead.

#### **Energy, geography, and people**

Energy resources capable of supporting further industrial expansion are widely distributed over much of the world. The United States has been greatly favored by nature in this respect but two reservations must be recognized: (1) United States resources have been relatively much more thoroughly explored than those of most new countries; (2) rates of depletion are much higher for the United States.

In the United States known reserves of energy resources have not been distributed by nature in proportion to the other natural resources to which the energy would be applied or to the population and industry for which the finished goods and services are needed. The location, the extent, and the rate of future development will depend on the degree to which the utilization of energy resources is coordinated with that of other natural resources and with the better utilization of human resources.

To list the factors of the problem is to emphasize the necessity for an over-all view: Welfare of the West, East, North, and South; coal and labor, and people; oil and labor, finance, transportation, and people; water power, navigation, irrigation, flood control, water supply, agriculture, and people; mineral

<sup>1</sup> Prepared under the direction of Assistant Director Ralph J. Watkins by the Staff of the Energy Resources Section.

resources, forests, agriculture, markets, labor, and people.

### Coal: Men and Jobs

#### Immediate Needs for War

The energy requirement of industry is primarily one for coal. Bituminous coal carries the main burden, with considerable aid from anthracite in the fuel-deficient North Atlantic coastal area. The greatest annual United States production of bituminous coal was 579 million tons in 1918. Since then the general trend has been downward in the face of expanding industrial activity, owing primarily to greater efficiency in use and substitution of petroleum. Production was 453 million tons in 1940 and about 503 million tons (preliminary data) in 1941. It cannot be said that potential bituminous coal requirements for 1941 have been fully met. On four occasions vital industries have been retarded by coal shortages or threat of shortage because of work stoppages in the mines.

For 1942 at least 540 million tons production should be planned, even assuming no increase in the combined war and essential civilian production program from the level of August–December 1941. The total productive capacity of the American economy is growing rapidly and if this expanding capacity is fully utilized in 1942 and succeeding years, additional quantities of bituminous coal will be required despite a long-range tendency toward more effective use of coal and substitution of competing sources of energy.

Anthracite production was 51½ million tons in both 1939 and 1940. The production rate in 1941 has been about 6 percent higher than in each of these two preceding years. Although anthracite is chiefly a household fuel, it has found expanded use in the defense program. Some further expansion appears probable in response to wartime needs.

The problem of coal supply is transportation, rather than production. If the industry is able to obtain necessary repair parts for maintaining its existing equipment, there should be little difficulty in meeting the exceptionally large demands of the war effort. Working time in the mines is relatively short and could be extended in case of critical need. Some expansion of production could be achieved by the use of a still large unemployed labor force in mines that can be worked by hand methods, although at increased cost. The labor force actively engaged in bituminous coal mining has been reduced, by greater efficiency in production and decline in consumption, from an average of 705,000 in 1923, the peak year, to 422,000 in 1939—and this with an average work week reduced from 48 hours to 35.

There is a need in the coal industry for wise guidance in the general interest to assure that the problem of

supply remains only one of transportation. Expansion of war activity will require expansion of coal production; most of this effort centers around the production of metallic and other mineral products in which coal plays an essential part.

#### Long-Range Trends in Coal

In assessing the total energy resources it is common to point out that coal resources are adequate for hundreds or even thousands of years, whereas the known resources of oil and natural gas at present rates of consumption will last only a fraction as long. Even though the remaining reserves of coal are relatively large, however, they are unevenly distributed and the coal to be mined in the future will, on the average, be less accessible and of lower rank than that available in the past. Furthermore, a slight geometric increase in the rate of coal consumption can greatly reduce the apparent abundance of the coal reserves. There is also the possibility that liquid fuels and a larger quantity of gaseous fuels may have to be produced from coal. Consequently there is a continued and increasing need for conservation measures—not to reduce the effective work accomplished by coal, but to get more coal out of the ground from each bed and to get more human benefit out of each pound of coal in use.

Technological change has been taking place at a rapid rate in the production and in the use of coal during recent years. Mechanization of coal mining has been accelerated, especially since 1934. There has been also a definite shortening of hours of work and marked increases in rates of pay. During the past year Federal legislation was enacted to enforce higher safety standards in the mines.

In utilization there has been a rapid shift in the grade of coal demanded. The coal industry is following the example of the petroleum industry in making its product more adaptable to consumers' needs. A larger share of the coal supply is being handled by automatic equipment at the point of use. New types of equipment, suitable to the needs of small consumers, have been developed and introduced on a large scale particularly where emphasis has been placed on convenience and on smokeless combustion.

There has been a relative increase in the demand for pulverized coal and for coal of the smaller sizes. This trend in demand has been fostered by equipment that can use the smaller sizes more efficiently. In former days most of the fine coal was wasted for lack of a market; for many decades after it became possible to use the finer sizes, slack coal was considered a surplus product and sold at very low prices. Recently there has been, for the first time in our history, an appreciable deficiency of small sizes and some of the prepared small sizes have been selling at relatively higher prices. An indication

of the rapid change that has been taking place is available from the records of the anthracite industry where standard size-categories have been well maintained. The prices of all the four larger prepared sizes—egg, stove, chestnut, and pea—decreased from 1936 to 1940; whereas those of the four smaller sizes—buckwheat Nos. 1, 2, 3, and 4—increased considerably in the same period. This shift in prices has not been due to a change in the relative supplies of these sizes, but rather to a decided shift in the technology of consumption. It is quite possible that in the long-term future almost all coal will be reduced to small sizes better adapted to automatic equipment.

#### Men and Jobs and Carbon

Coal is the most concentrated low-cost source of carbon; large and increasing quantities are being used for purposes other than power and heat. If new methods (which are not in sight) are not found to capture carbon from less concentrated sources and to make it available for energy as well as for chemical use, existing deposits of coal will exercise an increasing control over industrial development.

The uses of coal are increasingly complex. New methods for releasing the inherent energy of carbon are being developed and applied. In addition there is an expanding list of commodities being produced chemically, either directly from coal or through the recovery of byproducts. In terms of relative abundance, coal resources far exceed the resources of oil, natural gas, and water power, and this relative abundance foreshadows a commanding position for coal when the growth of consumer demands begins to require more energy than can be made available from alternative sources.

Coal mining has been an unreliable occupation for men and also for investment funds. Prospects are for a continuation in the trend toward greater efficiency in the older uses of the product. Unless there is a larger total use of energy, this will mean continued shrinkage in the market for coal as fuel and therefore in the market for coal labor and coal capital.

Better market prospects may appear ultimately through increased scarcity of competing fuels. More immediate possibilities, and more susceptible of encouragement, are: (1) The greater use of coal as a chemical and (2) increased requirements through general expansion of industrial production and of transportation, brought about by more employment and more purchasing power.

#### Petroleum and Natural Gas: A Problem in Prudence

##### Consumption and supply

Petroleum is one of the nation's most rapidly growing industries. Only a few industries have exceeded

its rate of expansion. Output of petroleum has fluctuated considerably, but in the period since 1920 production has averaged 6 percent higher with each succeeding year. Since 1929, the rate of growth has been somewhat slower than in previous years but it is still far more rapid than the average for total industrial production in the Nation. Crude petroleum production in 1940 was 1,353 million barrels and in 1941 it has been only about 4 percent higher than in 1940, although demands for refinery products have shown a much larger expansion.

Until the past few years the strongest requirement for petroleum products has been for gasoline. Because of this demand, refinery processes were adjusted to yield larger percentages of gasoline from the supply of crude petroleum. Recently, fuel oil demand has been gaining through a continuation of the upward trend in oil heating and a marked acceleration in the requirements for Diesel engines for marine use, railroads, electric power plants, farm tractors, and other equipment. A second recent upsurge of demand has been for aviation grades of gasoline to be used not only in airplanes but also in tanks and speed boats. The use of high-octane gasoline permits greater speed and power in military equipment. It is possible to install smaller engines and travel longer distances on a given quantity of fuel.

For lubricants produced from crude petroleum no satisfactory substitutes have been found that can be made available in large quantities and at reasonable prices. Increasing mechanization, therefore, has called for a larger output of lubricants from the petroleum supply.

Natural gas is partly bound up with crude petroleum since about half the production of natural gas in the United States is in conjunction with petroleum. Natural gas performs an important function in the efficient production of crude petroleum; at the present time, however, waste of natural gas is far more flagrant than waste of crude petroleum. In many instances, undue haste in extracting petroleum results in the wastage of gas which cannot be transported as easily as petroleum away from wells that are not accessible to trunk pipe lines.

Natural gas is the best available fuel from the standpoint of heating release and control, but it lacks the portability of petroleum and solid fuels. It is more difficult, therefore, to coordinate high-grade uses with availability of the fuel. The consumption of gas ranks all the way from the highest forms of utilization down to outright waste. As with crude petroleum, natural gas has certain specialized uses. Under present conditions, it is the only feasible source of high-grade carbon black so essential in the production of wear-resistant rubber, of paints, and of other chemicals. It is also a required

source of fuel for the glass industry and for many branches of the metallurgical and chemical industries.

#### Emergency and long-range needs

The war emergency period is placing special demands on the petroleum industry. Such demands are for: (1) Combat consumption, (2) production and transportation of military equipment, and (3) unusual civilian requirements. Ability to supply combat and related consumption might well be the controlling factor in the world-wide struggle. Direct military requirements for planes, tanks, trucks, automobiles, and ships are considerable and much of the need is for high-octane gasoline.

The war period is certain to leave an indelible imprint on the longer-term needs for petroleum. There is, for example, a likelihood of greatly increased use of airplanes, and some of the lengthening of commuting distances probably will remain.

The longer-term needs for petroleum and its products will depend on: (1) changes in consumption habits, including changes brought about by the emergency period; (2) the level of total production and consumption; (3) the relative price levels of competing fuels; (4) technological developments affecting the volume and type of fuel consumed; and (5) many other factors affecting transportation such as the patterns of industrial location, highways, and population. The prospects are for a continuing increase in over-all petroleum needs if the supplies continue to be available. The upward trend in consumption is likely to become decidedly stronger if a high level of income is maintained in the post-war period. Various studies indicate an increased expenditure on automobiles and motor fuel with increased family income. The conclusion appears inescapable that if we are to maintain high levels of activity in the economic system, our rich resources of petroleum should be safeguarded by attention to economy and efficiency in both production and utilization.

#### What do we know of reserves?

Latest available figures, those for January 1, 1941, indicate proved petroleum reserves of 19 billion barrels.<sup>2</sup> This reserve is equal to about 13 years' supply at the annual consumption rate of 1½ billion barrels reached at the end of 1941. Additional discoveries, of course, will be made to add to the reserves known at the present time; but we cannot afford to gamble too much on supplies that have not yet been discovered. The efficiency of extraction of petroleum depends partly on ratio of current production to existing reserves. An increase of this ratio beyond an optimum point will result in inefficient extraction and consequent loss of

potential supplies. An attempt to meet the demand of the next 13 years from the existing supply, even at present consumption rates, would shorten the practical life of the reserves to much less than present calculations indicate.

Because of the narrow margin of reserves, it is essential for planning purposes that accurate data on petroleum resources be available. Available figures on reserves are based on company estimates made by different methods and standards. Estimates for the same pools vary over a wide range. There is a need for official estimates based on more uniform methods of calculation. Better estimates should benefit the industry as well as the public.

In addition, it should now be possible to form some rough idea of the limit of undiscovered reserves in the United States and in foreign countries from which supplies might be drawn. Calculations would be based on geological information, geophysical measurements, soil chemistry, and other means bearing on the probable presence of petroleum. If foreign reserves are abundant and cheaper to extract than domestic reserves, and if we must depend on them at some time in the future, we should take action in time to introduce intelligent measures. Such action could improve international relationships, as for example with Latin America, would protect the United States against possible disadvantage in international competition and would promote national security.

#### Water Power: Inexhaustible Energy and River Control

##### Water Power Is Inexhaustible But Limited

"Water power is wasted if not used; to use it is, therefore, to conserve it. The quantity of water power that remains to be developed is strictly limited; its useful life is not. When the last pound of coal has been dug and burned, the power of falling water in the streams will continue to be available for human service."<sup>3</sup>

Water power—valuable as it is, and unique as it is in being restored constantly by nature—cannot supply the needs of industrial United States, even for electric energy alone. All the feasible undeveloped water power sites east of the Rocky Mountain States could supply only 60 percent of the electric energy that was actually generated for public use in 1940 in the same area. In the principal industrial regions—New England, Middle Atlantic, East North Central, and West North Central—the feasible undeveloped water power could supply only 34 percent of the electric energy generated for public use by fuels in 1940, and only 28 percent of the total generation for public use by fuel and hydro.

<sup>2</sup> Estimates of the A. P. I.

<sup>3</sup> National Resources Committee, *Energy Resources and National Policy*, January 1939, p. 293.

Table 1 gives details of these relationships.

The table compares potential undeveloped hydroelectric power with total electric requirements experienced in past years. Ratios (a) and (b) at the right show, for example, that in the New England States all of the undeveloped water power (column 7) could have supplied (a) only 50 percent of the total 1940 generation for public use, as given in column (1); or (b) 73 percent of the 1940 generation by fuel only, column (2). Ratio (c) shows that if the need for electric power continues to increase at the average rate experienced from 1921 to 1929 (column 3) the additional generation required for New England will exceed the total potential undeveloped hydro output in 10.96 years. Ratio (d) is a similar comparison with the years 1932-40.

The following statement written in 1938 for the report "Energy Resources and National Policy" may well be underlined:

Children now living will undoubtedly have the opportunity either to commend the present generation for its foresight in wisely guiding the development of the remaining water power in combination with other water uses and controls for the greatest good of the greatest number, or to criticize us for failure to recognize the unmistakable signals and to act with reasonable foresight on the ample information now at hand.<sup>4</sup>

It therefore appears that water power as a source of energy can furnish but a small part of the total energy requirement of the immediate future.

<sup>4</sup> National Resources Committee. *Energy Resources and National Policy*, January 1939, p. 308.

TABLE 1.—Undeveloped water power compared with total generation and fuel generation for public use, 1940, and growth in generation, 1921-29 and 1932-40

	Generation for public use, 1940 (thousands of kilowatt-hours)		Average annual increase in total generation (thousands of kilowatt-hours)		Average rate of increase in total generation over preceding year (percent)		Potential feasible undeveloped water power. Average annual output (thousands of kilowatt-hours)	Ratios			
	Total, fuel and hydro	Fuel only	1921-29	1932-40	1921-29	1932-40		Col. 7 to Col. 1	Col. 7 to Col. 2	Col. 7 to Col. 3	Col. 7 to Col. 4
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(a)	(b)	(c)	(d)
New England.....	8,968,302	6,195,304	411,440	427,380	9.42	6.18	4,508,500	0.50	0.73	10.96	10.55
Middle Atlantic.....	36,383,373	28,661,913	1,644,114	1,711,638	10.47	6.08	14,238,900	.39	.50	8.66	8.32
East North Central.....	33,612,066	30,754,463	1,762,605	1,930,492	12.29	8.00	3,069,100	.91	.10	1.74	1.59
West North Central.....	8,481,207	6,787,640	310,121	368,376	7.42	5.48	2,689,200	.32	.40	8.67	7.30
Subtotal.....	87,444,948	72,399,320	4,128,280	4,437,886			24,505,700	.28	.34	5.94	5.52
South Atlantic.....	17,617,508	11,865,257	827,716	1,055,164	12.88	8.50	22,425,000	1.27	1.89	27.09	21.25
East South Central.....	8,471,576	2,413,712	290,766	661,897	13.70	13.04	19,510,200	2.30	8.08	67.10	3.95
West South Central.....	7,433,502	7,114,509	444,109	410,642	17.69	7.50	5,927,200	.80	.83	13.35	14.43
Total except Mountain and Pacific.....	120,967,534	93,792,798	5,692,121	6,565,589			72,368,100	.60	.77	12.71	11.02
Mountain.....	8,544,075	1,773,905	264,529	751,793	10.00	16.43	58,844,100	6.89	33.17	222.45	78.27
Pacific.....	15,472,956	1,665,235	866,028	508,592	10.55	3.89	142,164,700	9.19	85.37	164.16	279.53
Total, United States.....	144,984,565	97,231,938	6,828,678	7,825,974	11.25	7.32	273,376,900	1.88	28.12	40.07	34.93

Sources: Figures on generation are from Federal Power Commission, *Electric Power Statistics, 1937; Production of Electric Energy and Capacity of Generating Plants, 1940*; and *Installed Capacity of Electric Generating Plants and Production of Electric Energy in the United States by Geographic Regions, 1920 to 1939*.

Undeveloped hydro is as estimated by the Federal Power Commission and published in *Energy Resources and National Policy*, National Resources Committee, January 1939, p. 301. The figures should be reduced for plants constructed since 1938, and perhaps increased for hydro found feasible through later studies. These corrections would not materially affect the conclusions of the present report.

Water power has a significance out of all proportion to its relative position as an energy resource. This is because (1) water power is used almost wholly as electric power, and electric power has become conspicuously a subject for public guidance in the public interest; (2) water power is a function of water control, and water control has become obviously a subject for public guidance in the public interest for broad reasons of public welfare quite unrelated to energy.

A third reason (not yet generally recognized) for the significance of water power in the energy supply is found in the future use of hydroelectric generating capacity, backed by storage reservoirs, as a "storage battery" or balance wheel in the great interconnected electric power systems that will be required to serve electric power needs of the future.

#### Water Power for War Production

The emergency value of water power projects, planned or partially constructed for normal peace-time needs, is illustrated by the current extraordinary construction program in the Tennessee Valley where hundreds of thousands of kilowatts are being provided more quickly than could be done by any other means. Similarly at Boulder Dam on the Colorado River and at Bonneville and Grand Coulee in the Northwest, most of the construction had already been completed; generating units and transmission lines are going into place swiftly, to serve new defense loads which could hardly have been met elsewhere or by other means.



Hydroelectric capacity at reservoir storage projects is peculiarly adapted to serve as a potential reserve against emergency needs. The incremental cost of adding additional units, where provision has been made for such expansion at storage dams, is generally low—reflecting low requirements for metal, labor, transportation, and time in construction when the emergency arises.

Events of the past 12 months should underline the conclusion that it is prudent national policy to advance the construction of river-control storage projects that are adapted also to the production of electric power, especially those which are near industrial centers or vital raw materials and transportation, and can be quickly equipped with additional generating capacity when the need arises.

#### **A Longer View: Power, Water, and People**

Four generations ago, water power was the only large-scale mechanical energy available; it directed the location of industries in the United States along the Fall Line and at isolated power sites elsewhere. The invention of the steam engine, the discovery of widespread coal deposits, the building of the railroads, and finally the development of means to generate and transmit energy in the form of electric power, released industry from dependence on any particular site within broad limits set by raw materials and markets. More recently, successful accomplishment in transmitting large quantities of electric energy over very long distances (as from Boulder Dam to Los Angeles, 266 miles) has further reduced the degree to which power and fuel costs alone control industrial location.

Between regions, the cost of fuel as affected by the nature of the deposits and by transportation, and the cost of electric energy as affected by fuel and the availability of low-cost water power, will remain important factors. East of the Rocky Mountain States the great bulk of growing electric energy requirements must be carried by fuel, because the potential water power is not sufficient; although the storage-battery function of future hydroelectric development at river-control reservoirs will tend to make possible large savings in the new investment required.

In the western States water power can and should continue to supply the bulk of electric energy needs, especially in combination with control projects designed primarily to conserve water for other purposes. There should be, however, an increasing use of fuel-electric generation for base load requirements where low-cost fuel is available and for standby service where the rivers cannot be sufficiently controlled.

The most important long-range aspect of water power therefore will be its influence on the development and control of water for other purposes, both West and

East. Only on a few great rivers are there opportunities remaining to develop hydroelectric power alone at costs much lower than those of modern steam-electric generation; but water power in conjunction with other useful purposes can make feasible the harnessing of reckless or unreliable streams for human protection and human needs. In many river valleys irrigation, navigation, water supply, flood protection, sanitation, recreation, all may depend for feasibility on electric power as the paying partner.

Consideration of these interlocking relationships of water use makes clear the need for over-all coordination in planning the development of water resources and energy resources and in the construction and operation of the appropriate public and private works.

#### **Electricity: Means of Modern Production**

##### **Electric Power for War: Organization of a National Supply**

"Insofar as the plants and machinery can be constructed, it will be the part of prudence to maintain enough reserve generating capacity to care for war-time needs without curtailment of essential civilian demand and to avoid the actual shortages of power already threatening in various places."<sup>5</sup>

Demands for electric energy have already increased even more than expected, though war production is by no means in full swing. Widespread and extreme (but not unprecedented) lack of rainfall in 1941 cut down the output of hydroelectric plants in Southeast and the Northeast, most of which are not backed by storage reservoirs contemplated in multiple-purpose developments of the future.

"For most industrial regions, at least, the outlook is for twice as much demand within the next decade or so. Such greatly increased needs will call for systems of supply based on large efficient steam-electric stations in areas of low-cost fuel, coordinated with storage hydroelectric plants by transmission networks extending over several States.

"A basic system of publicly operated high-tension lines will speed this necessary development. Transmission links between important load centers and power sources should be planned immediately as elements in such a backbone system, not only for economy but to protect the power supply of industrial regions vital to the national defense."<sup>5</sup>

The need for proper organization to plan and operate power supply is again emphasized. Study should be devoted to this problem in relation to the even more compelling need for unified operation of great reservoir systems. It is not effective, nor even safe, to operate chains of reservoirs except under unified control. The emergency may compel setting up temporary coordina-

<sup>5</sup> National Resources Planning Board, "Development of Resources and Stabilization of Employment in the United States," January 1941, p. 46.

TABLE 2.—Electric energy used, wage earnings, and value added by manufacture, per wage-earner man-hour in selected establishments, and total value added by manufacture for corresponding industrial groups in the United States, 1935, 1937, 1939

[Table prepared for this report by Fayette S. Warner of the Federal Power Commission staff]

Industry	Selected establishments <sup>1</sup>									Biennial census totals		
	Electric energy used (kilowatt-hours per wage-earner man-hour)			Wage earnings (cents per wage-earner man-hour)			Value added by manufacture (dollars per wage-earner man-hour)			Value added by manufacture in corresponding industrial groups		
	1935	1937	1939	1935	1937	1939	1935	1937	1939	1935	1937	1939
Flour and other grain mill products.....	11.81	11.83	13.97	51.8	52.7	55.1	2.71	2.37	2.81	\$136,996,880	\$133,599,809	\$143,831,569
Feeds, prepared, for animals and fowls.....	5.57	5.24	6.27	47.9	49.5	50.9	2.55	2.45	3.09	58,039,945	76,706,055	99,240,060
Cereal preparations.....	8.09	8.14	8.18	58.9	65.6	68.5	4.45	4.13	4.89	64,247,823	65,680,326	70,348,568
Meat packing, wholesale.....	2.78	2.78	3.14	55.7	63.0	64.8	1.35	1.46	1.66	332,364,808	399,726,928	423,242,072
Sugar, beet.....	4.49	5.49	6.60	44.2	53.3	52.6	1.15	1.72	2.19	24,617,340	38,399,432	49,444,645
Sugar refining, cane.....	6.74	7.16	7.70	52.8	57.8	61.6	1.56	2.24	2.13	41,037,771	61,978,095	55,993,137
Liquors, distilled.....	.....	6.04	7.39	.....	58.9	60.5	.....	3.14	3.35	76,354,955	30,903,398	27,696,365
Liquors, malt.....	.....	3.54	4.65	.....	84.7	84.7	.....	3.65	4.90	280,111,869	335,188,522	363,180,423
Cigars.....	.29	.30	.34	35.1	37.4	39.0	.79	.82	.92	73,450,710	81,895,403	81,605,337
Cigarettes.....	1.30	1.28	1.44	42.2	50.5	53.0	3.81	4.12	4.61	165,377,080	197,405,408	226,679,202
Tobacco (chewing and smoking) and snuff.....	.67	.75	.92	44.1	47.9	51.0	2.67	2.68	2.63	45,546,858	45,758,675	41,967,813
Cotton yarn and thread.....	4.62	5.53	5.93	35.0	37.9	36.2	.59	.70	.69	80,731,261	105,510,374	108,880,111
Cotton broad woven goods (over 12 inches in width).....	4.98	5.31	5.85	37.0	41.1	38.2	.55	.72	.75	289,808,549	441,163,219	438,330,852
Cotton narrow fabrics.....	1.10	1.19	1.26	44.0	45.8	44.8	.87	.89	.98	21,576,264	21,371,200	25,566,259
Batting, padding, wadding, upholstery filling.....	3.18	2.74	2.86	42.0	49.5	48.6	1.67	1.44	1.57	9,777,759	12,982,145	13,291,635
Woolen and worsted woven goods <sup>2</sup> .....	1.94	2.25	2.35	48.8	56.0	51.2	.85	1.01	1.01	257,054,984	281,759,175	262,962,235
Woolen and worsted, dyeing and finishing.....	.....	1.33	1.93	.....	56.9	53.1	.....	1.31	1.26	9,213,799	6,387,451	10,483,584
Recovered wool fibers—regular factories.....	.....	2.20	3.15	.....	49.9	45.2	.....	1.00	1.17	13,798,016	11,586,564	9,290,688
Felt goods, except woven felts.....	3.00	2.91	3.03	47.7	56.1	56.5	1.42	1.35	1.54	10,192,052	10,999,688	10,525,510
Woolen and worsted carpet yarn.....	2.18	2.03	3.08	61.0	61.8	57.0	1.05	1.13	1.37	2,209,481	5,102,506	8,113,109
Wool carpets and rugs (other than rag).....	1.40	1.50	1.89	54.0	60.6	65.1	1.14	1.49	1.72	59,022,981	78,612,936	79,272,091
Rayon throwing and spinning—commission only.....	3.26	3.54	4.62	34.8	33.7	34.0	.52	.54	.54	4,869,211	1,927,299	2,473,937
Rayon yarn and thread—processed for sale.....	1.39	3.21	4.49	39.5	37.0	36.3	.81	.71	.70	5,306,239	6,928,732	7,843,657
Rayon broad woven goods—regular branch (18-inch width and over).....	2.04	2.55	3.33	45.0	47.0	42.3	.71	.78	.76	71,291,650	80,581,450	95,271,339
Silk throwing and spinning—commission only.....	3.10	3.51	3.56	36.1	35.1	35.8	.52	.53	.57	13,906,755	11,645,165	12,445,627
Silk yarn and thread—made for sale.....	2.17	2.73	2.55	38.6	41.0	39.3	.68	.67	.79	9,493,590	12,737,071	13,978,214
Silk broad woven goods—commission branch (18 inches wide and over).....	1.39	1.55	1.27	39.2	38.5	37.4	.52	.51	.50	.....	.....	.....
Silk broad woven goods—regular branch (18 inches wide and over).....	1.47	1.67	1.93	43.3	43.7	46.2	.72	.70	.86	37,382,339	24,211,910	15,063,832
Silk narrow fabrics.....	.67	.73	.62	51.8	51.5	47.1	1.08	1.00	1.01	8,244,818	8,519,361	8,310,078
Hosiery (full-fashioned and seamless).....	.62	.67	.76	51.2	50.8	49.6	.76	.74	.79	168,625,421	201,658,270	228,137,697
Knitted cloth.....	1.48	1.96	1.96	44.4	48.0	47.0	.90	1.06	1.08	20,546,921	23,702,740	24,457,089
Knitted outerwear—contract factories.....	.....	.38	.41	.....	43.2	45.5	.....	.77	.80	.....	3,933,559	5,780,460
Knitted outerwear—regular factories.....	.....	.41	.45	.....	45.0	44.3	.....	.93	1.01	.....	43,377,559	39,530,276
Knitted underwear.....	.78	.84	.91	39.2	39.5	38.6	.72	.77	.73	42,124,282	55,812,397	51,739,201
Paper and paper board.....	<sup>3</sup> 23.90	24.75	27.18	52.9	60.2	61.4	1.43	1.65	1.73	282,472,837	390,490,634	400,755,143
Pulp (wood and other fiber).....	<sup>4</sup> 41.15	45.68	49.49	49.3	58.4	59.5	1.31	1.65	1.42	71,029,848	93,540,011	82,115,176
Rayon and allied products.....	9.70	11.22	13.47	52.0	61.4	65.3	1.24	1.84	1.83	120,646,333	174,081,323	168,605,857
Drugs and medicines (including drug grinding).....	.....	.95	1.51	.....	54.1	52.3	.....	5.25	5.45	.....	250,269,662	249,712,831
Insecticides, fungicides, and related industrial and household chemical compounds.....	.....	1.47	1.94	.....	52.7	51.9	.....	4.05	5.25	.....	40,951,310	49,068,125
Perfumes, cosmetics, and other toilet preparations.....	.....	.48	.46	.....	46.5	46.2	.....	4.00	4.53	.....	78,431,139	88,955,659
Soap and glycerin.....	3.64	3.78	4.47	56.8	68.6	70.1	3.77	4.17	5.30	99,658,872	116,121,758	141,631,798
Petroleum refining.....	13.84	16.15	20.12	77.1	90.4	92.0	2.52	3.10	3.74	356,685,539	482,439,103	527,882,306
Leather, tanned, curried, and finished—regular factories.....	1.87	2.06	2.25	55.4	61.6	61.7	1.11	1.15	1.27	110,374,896	108,687,913	106,987,011
Rubber boots, and shoes.....	2.04	2.07	2.50	60.0	60.6	63.4	1.01	1.10	1.10	32,341,367	36,950,776	29,231,223
Rubber tires and inner tubes.....	10.16	10.73	11.29	84.1	94.5	93.3	1.94	2.04	2.40	180,576,201	209,001,819	231,372,127
Rubber products, not elsewhere classified.....	3.89	4.26	3.77	51.3	57.9	54.4	1.22	1.31	1.43	95,930,590	122,789,539	141,640,823
Cement.....	46.12	48.85	57.99	55.6	64.0	67.1	2.09	2.16	2.65	77,327,841	113,221,833	124,081,548
Blast-furnace products.....	.....	14.15	25.97	60.3	75.3	74.0	2.41	2.55	2.29	.....	127,644,430	87,082,842
Steel works and rolling-mill products <sup>4</sup> .....	<sup>5</sup> 9.21	10.34	13.43	65.0	81.7	82.7	1.21	1.57	1.67	820,855,527	1,376,314,460	1,238,075,219
Cast-iron pipe and fittings.....	.....	1.88	1.89	.....	54.2	55.3	.....	1.08	1.14	.....	35,677,067	37,065,055
Wrought pipes—welded and heavy riveted.....	.....	4.28	4.84	.....	78.6	78.3	.....	1.78	2.17	.....	45,139,961	34,008,394
Steel barrels, kegs, and drums.....	.....	1.73	2.32	.....	59.4	64.5	.....	1.45	1.45	.....	17,879,670	16,837,627
Tin cans and other tinware, not elsewhere classified.....	.....	1.57	1.83	.....	56.1	59.1	.....	1.72	2.05	.....	113,686,079	123,571,799
Wire drawn from purchased rods.....	.....	4.92	5.62	.....	71.7	80.3	.....	1.73	1.78	.....	81,774,256	76,521,092
Radios, radio tubes, and phonographs.....	.....	1.16	1.34	.....	58.2	54.8	.....	1.36	1.50	.....	122,901,524	130,020,092

<sup>1</sup> Source of data: Bureau of Census and Bureau of Labor Statistics, man-hour statistics for 59 selected industries, 1935; for 105 selected industries, 1937; and preliminary figures for 1939. Data for many additional industries for 1939 are in preparation.

<sup>2</sup> Estimated from later data.

<sup>3</sup> Includes wool combing, woolen yarn, worsted yarn, woolen woven goods (including woven felts), and worsted woven goods.

<sup>4</sup> 1939 data adjusted for comparability with previous years by combining steel castings with steel works and rolling mill products.

NOTE: Industry classifications are not strictly comparable for all the 3 years given in the case of cotton broad woven goods (over 12 inches in width); woolen and worsted dyeing and finishing; woolen and worsted carpet yarn; rayon yarn and thread—processed for sale; rayon broad woven goods—regular branch (18-inch width and over); silk yarn and thread—made for sale; hosiery (full fashioned and seamless); knitted outerwear—contract factories; knitted outerwear—regular factories; knitted underwear; drugs and medicines (including drug grinding); insecticides, fungicides, and related industrial and household chemical compounds; rubber products, not elsewhere classified; and tin cans and other tinware, not elsewhere classified.

tion of power supply without reference to long-range objectives, but this must not prevent adequate provision for comprehensive regional development of water, land, and energy resources each in harmony with the others for the public interest.

#### **Electric power and productivity**

Electric power has brought increased production per man-hour. This should mean more for everybody because more goods can be produced by the work of every man; but if total production is not increased, it means less work and fewer jobs. The use of power has increased and is increasing along with productivity and wages per man-hour, as illustrated in table 2. The tendency for energy use to increase with wages and also with productivity, as measured by "value added by manufacture," is marked. Mechanical power used per man and per man-hour increased from the beginning of American industry, and this increase continued steadily and rapidly throughout the recent depression; the rate for 1935-39 was 5 to 10 percent per year in many industries.

Electricity has two major functions in industry: (1) To deliver power, adaptable and economical for almost any purpose, large or small, at the point where needed,

at low cost; (2) to provide automatic control, certain, reliable, tireless, and accurate; bringing into commercial reality processes and procedures not heretofore known or considered feasible or possible. The generalized result of increased use of electricity is increased production per man-hour—a measure or an index of technological change. The available data suggest that the share of employed labor and the public in the output of industry increased through the depression years along with productivity.

The challenge is to direct these changes in the public interest; to make increased production per man-hour mean, not fewer jobs, but more goods and services.

#### **Power, labor, production, and people**

Neither this country, nor any country, has ever produced as much as its people were hungry to consume. The paradox of want amidst apparent plenty is recent in our minds. Proof that it need never recur is forming now; wartime production will boost national income in 1943 and 1944 to twice that of 1933.

Much of this huge national total is in war material—guns, munitions, planes, and tanks. But if we do this for war, we can do it for peace. Part of the answer is more use of power.

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## PART III

### 5. EVALUATION OF PUBLIC WORKS FOR LAND PROTECTION, DEVELOPMENT, AND USE<sup>1</sup>

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In the January 1941 Report of the National Resources Planning Board, "Development of Resources and Stabilization of Employment in the United States," a section entitled "Land Development Policies" outlined the place of a public works program for land protection and development in the general economic structure of the Nation.

That statement set forth a broader concept of public works than the ordinary concept of public structures, such as post offices, lighthouses, and power or irrigation dams on public land—a concept which included as well all public construction and improvement on public land, or on privately owned land if there should be a public interest in such work. Thus it considered forest planting, fire breaks on forest or range land, or contour furrows or terraces on crop land as public works. The statement pointed out that a public works program for conservation and development of land resources not only would provide opportunities for short-term employment in times of widespread unemployment, but would help provide the net gain in productive capacity essential to the continued growth required for optimum employment and a rising plane of living. It stressed the necessity of keeping a public works program on the land in harmony with other public works and with the national economy, and warned against permitting a public works program to contribute toward freezing the present pattern of land use where that pattern might be undesirable.

The statement set forth a skeleton outline of public works for agricultural areas, including soil conservation, land reclamation, and provision of public facilities for rural residents; for forest lands; for range land; for recreational land; and for land used primarily for protection and development of fish and wildlife. It laid down general principles for evaluating individual public works projects on the land, which in substance are as follows:

Projects should be technically sound, both from engineering and biological viewpoints. Benefits arising from them, including nonmonetary and intangible benefits, should exceed their costs. There should be a consistent policy in distribution of costs among all agencies for related types of projects. In periods of relatively high employment, persons receiving benefits

in the form of increased income and services directly traceable to them should ordinarily pay the cost of such benefits, and the Federal Government should assume the cost of only those benefits which are widely distributed, contribute to an important national policy, or are part of an established public responsibility or function. In periods of heavy unemployment or in depressed areas, however, the Federal Government may properly assume such additional portions of the cost as may reasonably be assigned to the relief of unemployment and the stimulation of the economic system. Projects should harmonize with regional and functional development plans. The value priority of projects ordinarily should be determined in terms of the above criteria. Timing of projects should be planned to give the greatest remedial effect on both long-term and short-term dips in the economic cycle. Administrative considerations also are entitled to some weight.

Since the January 1941 report was published, the preparation of general programs for public works on the land including evaluation principles applying specifically to the various types of activities, has been undertaken under the direction of the Evaluation Subcommittee of the Land Committee with the cooperation of the agencies in the Departments of the Interior and Agriculture that are responsible for carrying on such programs. The purpose of the following statement is to indicate briefly the nature of these public works programs and to sketch some of the more important considerations in the evaluation of works in the several rural land fields.

While it is recognized that the same land area may have multiple uses, for convenience of discussion the lands on which public works programs are conducted are treated separately according to their major uses, under the headings of agricultural lands, range lands, forest lands, recreational lands, and land and water for protection and development of fish and wildlife.

#### Agricultural Lands

##### Objectives

In approaching the evaluation of specific proposals for public works affecting agricultural land, it is basic that we relate them to the general objectives of agricultural activities. As a guide, these general objectives may be summarized as follows: To meet society's needs for the products of agriculture at a high level with

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<sup>1</sup> Submitted by the Land Committee of the National Resources Planning Board.

permanency and stability; and to enable all people who work in agriculture to have security of income, comforts of living, and cultural opportunities consistent with their contribution to the general welfare.

The provision of agricultural products for consumption at a permanently high level requires first of all a stable and productive land resource base to support the necessary production; hence the various activities for soil and water conservation, utilization, and development are generally in harmony with the broad objective.

The degree to which any one of the various conservation and development activities contributes to general agricultural objectives depends, however, upon the extent to which it is carried. Activities, such as soil-conserving practices, which may be highly justified when applied to a limited degree, may be quite unsound if applied too intensively. A major problem in the evaluation of various agricultural land-use activities is, accordingly, to determine whether the degree to which each of these activities is at present applied or the degree to which it is proposed that each be applied is consistent with the relative need for such a degree of activity, and its relative cost.

Provision for people who work in agriculture to have security and an adequate standard of living requires that opportunities to share in the results of production are not limited to a favored few. The extent to which disadvantaged families are benefited should be an important criterion in evaluating public works affecting agricultural land use. Activities leading to the settlement of new land in family sized units, for instance, derived much of their justification from this principle.

Public works should be appraised in terms of their direct contribution to the welfare of rural people as well as in terms of their contribution to the production and wise use of physical resources. The people who work in agriculture are the chief custodians of our agricultural resources as, well as the providers of food and fiber. Their health, education, adequate housing, and welfare are important to the entire Nation.

#### Relation of Projects and Activities to General Plans

The evaluation of public works affecting agricultural land use requires the consideration of specific proposals. These proposals may be for individual projects, such as a large irrigation project, or for more general programs, such as a program of aid to soil conservation districts for a State, a region, or the country as a whole. It is important in evaluation to keep in mind the place of various types of activities in an over-all program concerned with land and people in agriculture. A discussion of some of these follows.

*Production Adjustment, Land-Use Shifts, and Soil Conservation.*—Facilitating the shift of land to better

use, in terms of provision for consumption needs and demands, in terms of providing opportunities for people to make a satisfactory living and in terms of the conservational use of resources, is a basic feature of an over-all program. Shifts from one type of crop use to another and from crops to less intensive uses, such as grazing and forestry, are necessary for adjusting production to demand, for improving over-all opportunities to make a living and for facilitating sound farm unit adjustments; but shifts for these purposes cannot be divorced from shifts for purposes of conservation.

Federal payments now made to farmers not only facilitate the adjustment of production to consumption needs and demands, but also encourage designated soil conservation practices; and, in addition, often enable farmers voluntarily to undertake further conservation measures. Similarly the planning and execution of conservational farm plans tend to guide farmers in determining the desirable uses of their land. Soil conservation activities must be judged, in part, on the basis of their effects on production and desirable land use; and programs for accomplishing shifts in production and land use must be judged, in part, on the basis of their conservational effects.

*Soil Conservation and Flood Control.*—Soil conservation and run-off retardation are closely related. Measures which accomplish soil and moisture conservation, such as terracing, cover-cropping, contour furrowing, etc., also serve the purpose of helping prevent excessive run-off and flooding of the lower reaches of watersheds, though it must be recognized that land treatment for flood control requires usually more intensive, and often different, practices and works than does soil conservation by itself. Where agricultural conservation treatments serve a dual purpose, it is warranted that they be undertaken at a rate and intensity which is greater than if there were no downstream benefits.

*Land Development and Settlement.*—The development of land for more intensive use in settled areas or of additional agricultural land in new areas is in some respects similar to soil-conservation activities. Both general types of activity are concerned with improving the Nation's total agricultural resource base. Both must be judged in part in relation to the need for agricultural land, both regionally and nationally. New land development tends, however, to carry with it an idea of additional ownership units or support for additional families. A given amount of capital spent in settled areas might produce as much or more in terms of total product than if spent in the development of new areas; but the development of new areas always holds out the possibility of providing for those people who would otherwise have only meager opportunities to become farm operators, or who are now on land too poor for farming. The program of land development should, of



course, be correlated with a program for rehabilitating, or shifting to less intensive use, inferior lands now in cultivation. The degree to which these several activities are carried should be so balanced that, with a given cost, they will collectively provide maximum opportunities for farm families to make a living.

Land is developed for agricultural use mainly through clearing, drainage, and irrigation; and often two or more of these activities must be performed on the same land. Flood control, as in the Mississippi Delta, also contributes extensively to making additional land available for agriculture. Land development through these various channels may involve rehabilitation of areas already settled, as well as provision of areas for new settlement.

The settlement of people on new land and bringing new land into production involve much more than clearing, drainage, or irrigation. It normally requires additional improvements, such as land leveling, homes, fences, other farm facilities, and various community facilities. New land development and settlement, accordingly, tend to require much larger amounts of capital and credit than is available through usual channels to those persons who would benefit most by settling in new areas.

In summary, agricultural land development activities should be appraised in terms of the need for such land, and in relation to a program for adjustment and improvement of lands already settled, to necessary settlement costs, and to the availability of capital and credit.

*The Relation of Institutional Factors.*—In evaluating public works affecting land use, the influence of certain institutional factors, such as ownership, tenure, credit, and zoning, must be given careful consideration.

The possibilities of success in achieving desirable land use shifts, soil and moisture conservation, and land development often hinge on the acquisition of certain lands by the public. Where soil deterioration has been severe, necessary readjustments often cannot be accomplished by present occupants; and public acquisition of such lands can frequently serve not only to accomplish these adjustments but also to facilitate a more widespread program of conservation. The public acquisition of lands in advance of development and settlement is often necessary if speculation is to be avoided and settlement is to be adequately guided.

Soil conservation is closely related to tenure. Uncertain and short-time tenure has a tendency to encourage exploitation. Public works for accomplishing soil conservation may, therefore, be only partially successful or nullified if applied without reference to conditions of tenure.

The lack of income is a basic condition underlying soil depletion. Adequate credit on reasonable terms is not a substitute for income; but it can contribute greatly

toward minimizing the pressure toward soil depletion. Adequate long-term credit is also an integral part of providing opportunities for new farm undertakings.

Zoning, like land acquisition, desirable tenure arrangements, and effective credit, is an important instrument for facilitating land use objectives through public works or otherwise. In many areas, especially those in transition from one use to another, the objectives of public works can only be accomplished if such works are accompanied by adequate land-use regulations. The existence of such provisions will often, therefore, have a considerable bearing on the desirability of proposals for public works affecting agricultural land use.

*Facilities.*—Activities contributing to the conservation and development of agricultural land resources are carried on by people who must have homes, medical care, and education—who are part of a community requiring roads and schools and government. Adequate provision of these facilities and services is as essential to the efficiency and welfare of the people who work in agriculture as it is to the efficiency and welfare of other citizens. General rural facilities can contribute both to the effective use of land resources and to improvement of the health and welfare of people in agriculture. Adequate farm-to-market roads, for instance, are essential to getting agricultural products to the consumer at a moderate cost. Medical facilities, educational facilities, rural electrification, better rural housing, rural libraries and facilities for training rural youth are further illustrations of works and services that can contribute effectively to the welfare of people in agriculture. Facilities and services that enable rural people to have health, training, and cultural conveniences, if in balance with opportunities for making a living, form an integral part of a rounded program for rural farming areas.

#### Comparison of Costs and Benefits

That total benefits of any undertaking which affects agricultural land use should exceed total costs is axiomatic. The application of this principle in the evaluation of specific public works proposals is very difficult. Total benefits include intangible benefits that cannot be measured in monetary terms and social benefits that cannot be traced to specific individuals, groups, or localities. Intangible costs and costs that cannot be effectively localized are similarly involved.

The problem is to devise means for arriving at reasonable judgments concerning costs and benefits. Although it is difficult to reduce all costs and benefits to the common denominator of dollar values, an attempt to translate as many as possible into this form will tend to reduce the realm in which it is necessary to rely on more general judgments. In large measure, however, the benefits of public works affecting land use will have to be judged in terms of their contribution to broad agricultural and social objectives.



*Conservation.*—Soil and moisture conservation activities have their justification in part from the added income which may be derived in the near future as a result of such activities; but in part they must be justified in terms of provision for the more distant future. In ordinary business terms, it would be necessary to discount future benefits at a business rate of interest. This would limit unduly the total expenditure for erosion prevention and soil productivity that could be justified in terms of costs and benefits, for the public interest in preserving land for the future is just as great as the private interest in using the land for immediate gain. In evaluating soil conservation activities, therefore, it should be borne in mind that many of the benefits of soil conservation that occur in the future are as valuable to society as if they occurred in the present.

*Land Development.*—The costs and benefits of activities facilitating the development of additional land for agriculture must be considered largely with reference to the prospective need for additional agricultural land. The need for agricultural land must, however, be viewed both with reference to the need for agricultural products and with reference to the need of opportunities for people to make a living.

The development of additional land through clearing, drainage, flood control, or irrigation and related improvements is essentially an investment in additional agricultural productive capacity. Although population continues to expand and other factors point to some increase in the need for agricultural products as compared to recent years, the benefits from projects and programs for new land development must come largely from greater efficiency in production and provision for farm families than is possible on other lands now in agricultural use. No large increase in acreage devoted to agriculture as a whole appears necessary in the near future, although there may be need for increasing the acreage devoted to particular crops.

In attempting to arrive at an evaluation judgment concerning specific land development projects, it is helpful to consider how many families are likely to be supported at a reasonable level of income at a given over-all cost. If more families can be maintained at a reasonable income level, with a given over-all cost, on the new land than on the less productive lands now in cultivation, the land development proposed is probably justified.

In arriving at this judgment, a wide variety of costs and benefits must be counted. It must be noted that the costs and benefits of a development project are not normally confined to the particular land area upon which these activities take place. Irrigation projects, for instance, often have their justification to a large extent in the stabilization they provide for surrounding areas. On the other hand, increased production of

certain crops in a newly developed area may result in considerable hardship—decrease in population support—to other areas. In considering the cost of bringing a particular piece of land to a point where it will support a family, it is important that those costs noted earlier, such as the costs of housing and home improvements, the community costs which must be shared and the costs of “waiting,” be included. On the whole, these various costs and benefits should be compared for each area of land proposed for development and settlement and then the possibilities in the several areas compared with one another. In this way those projects may be favored that provide maximum population support at minimum cost for the country as a whole.

*Facilities and Services.*—Rural facilities, as considered in this report, consist largely of more or less durable consumption goods, and services; and cannot, generally, be judged in terms of their contribution to production and population support. It may, however, be possible to utilize commonly acceptable minimum standards for these activities, and specific proposals for activities in these lines could then be evaluated with reference to those standards. Minimum standards, commonly accepted, are in a sense a social judgment that facilitates and services up to such levels tend to have social benefits in excess of costs. Monetary calculations of benefits in this realm are but slightly helpful. The activities must be weighed largely against our social philosophy concerning the desirability of minimum social provision for human needs.

#### Financial and institutional arrangements

The desirability of undertaking proposed public works activities affecting agricultural land use depends in part upon the arrangements for bearing the costs and distributing the benefits. In general, costs should be shared among individuals and Government in rough proportion to benefits, except in cases where individuals or groups could not, under such an arrangement for sharing the costs, undertake activities that should be undertaken in the national interest. Often, in the interest of economic reconstruction and employment stabilization, the Federal Government may be justified in bearing more than its proportion of the costs up to the absolute limit of broad social benefits. Unfortunately the lack of criteria and techniques for the precise measurement and allocation of social benefits makes it necessary to resort to general judgments when attempting to apply the above principle in the evaluation of specific proposals. There follow a few illustrative suggestions and considerations that may help in arriving at general judgments.

A large contribution by benefiting individuals, relative to the usual contribution for similar projects,

would normally be a favorable characteristic. There may, however, be cases in which a project proposing a relatively small contribution, such as those designed to rehabilitate depressed groups or communities, should be given a favorable rating.

In the absence of yardsticks for measuring precisely the public or general social interest in many public works affecting agricultural land use, emphasis may well be placed on the adequacy of institutional arrangements to assure that the public benefits contemplated, when any proportion of public aid is given, will actually be achieved. A large proportion of all works for the protection and development of agricultural land must take place on land in private ownership. Public participation in rural works on private land tends to be largely in the form of technical guidance and financial assistance. Where soil conservation districts, other local units of Government, or cooperative groups exist, there is a possibility of continuity and social control over nonconforming individuals. Often such organized groups can develop legislative action and land use regulations necessary to promote conservation and wise land use. It is always important that public aid be accompanied by adequate arrangements for assuring continued action in the public interest; but it is especially important in the situations in which the Federal Government assumes an exceptionally large responsibility for bearing the costs. In such situations, organization for effective use of public aid, and development of appropriate regulations, zoning ordinances, etc., may serve as something of a substitute for a larger local contribution.

The problem of financial arrangements for desirable conservation and development activities on agricultural land becomes greatly simplified when the land upon which they are to take place is publicly owned. In such a case, the public, initially at least, bears all the costs. The public ownership of land requiring rehabilitation, development, or adjustment also provides the possibility of adequate control. The rebuilding of land submarginal for agriculture is often possible only if the land is first brought into public ownership.

Actually to accomplish the desired land-use objectives, land publicly acquired must, of course, be properly managed. In the field of new land development and settlement, public acquisition of land considerably before construction, and financial arrangements by which development is carried well along before being turned over to private individuals, may avoid much speculation and distress and serve to achieve social benefits which otherwise might be lost.

### Range Lands

Range lands, which produce uncultivated forage suitable for domestic livestock, occupy slightly more than

half of the land area of the United States, or about 970 million acres. They are made up of approximately 728 million acres in the West, 40 million acres in the North and East, and 200 million acres in the South. About 610 million acres or 63 percent of the range lands are privately owned. Of the 360 million acres in public ownership, the Federal Government owns about 295 million acres. The remainder is owned by States and counties.

The rehabilitation, maintenance, and improvement of the range lands is highly important, not only for the direct contribution which the range makes to the Nation's food and fiber supply, but for the basis it provides for an extensive livestock industry and for the protection which range vegetation affords, when in good condition, to the watersheds of major streams. The range lands produce more than 80 percent of the country's wool and 40 percent of its meat and hides. Furthermore, a large part of the area within drainage basins contributing to a 6 billion dollar irrigation industry, is grazed. The range lands have substantial additional values, difficult to estimate in monetary terms, in the production of wildlife and the provision of opportunities for recreation.

To rehabilitate and to increase the productivity of the range lands, which over broad areas are sadly depleted, the agencies responsible for administration of grazing lands in the Department of Agriculture and the Department of the Interior propose a long-term program of public works, which to achieve full value must be accompanied by adjustment of livestock numbers to forage capacity. The public works program would include soil and moisture conservation works, fire control, revegetation, rodent and noxious plant control, and such range improvements as stockwater reservoirs, wells, spring improvements, fences, and driveways and trails.

### Evaluation Principles

Evaluation principles for public works on range land follow closely the general principles for all public works. Some evaluation factors peculiar to range public works follow.

Public works constructed for rehabilitation and improvement of range lands usually are relatively simple; nevertheless, they must be adequately investigated, planned, designed and executed, or they will fail to accomplish their objectives. Erosion control and water retarding structures, for example, must be designed to withstand the largest flows of water without deterioration and to control soil movement effectively. Engineering standards for the majority of range land structures are well worked out, have been amply tested, and are available to the field personnel of the range management agencies.

*Costs and Benefits.*—Costs per acre of public works on range lands are generally low. Range lands themselves usually are low in value, however, and the cost of an individual range project should bear a reasonable relationship to the value of the land benefited after the improvements have been made. It should be recognized, of course, that benefits may be spread over an area far greater than the acreage directly treated.

The benefits from a public works project on range land most frequently inure to the stockmen using the land under treatment, and may consist of increased income arising from reduced erosion damage, increased range capacity, reduced livestock losses, increased efficiency of operation, etc. Estimates of such benefits may be made in dollars and cents with some degree of accuracy. Range projects involving soil and water conservation are likely also to have more general benefits in the form of reduced siltation of downstream reservoirs, reduction in costs of downstream flood control structures, and protection of high-value valley lands, especially irrigated lands, from damage by excessive runoff from the upland ranges. These are economic benefits, but they are difficult to estimate and equally difficult to allocate to particular individuals or groups. Finally, there are such intangible benefits as removal of signs of neglect of resources and improvement of aesthetic conditions of human habitat, which may be substantial.

*Financing.*—A large volume of public works for range lands would be on land owned by Federal agencies, and on land thus owned should be financed by the Federal Government. Various other agencies, organizations, and individuals should assist in financing public works on State and county owned range lands. Fire associations, for example, cooperate in construction and maintenance of fire control works. States and counties usually assist in financing truck-trail and bridge projects. Fences and stockwater facilities are integral with ranch operations, and labor or materials for their construction commonly are furnished by ranches, even when the improvements are on public land. Maintenance should be accepted by the most interested user or users.

Public works on privately owned range lands undertaken to safeguard the public interest in the range resource, such as erosion and flood control, or range improvement, should be financed cooperatively by the Government and private owners. The costs should be assigned on the basis of benefits accruing nationally, locally, and individually. Such projects preferably should be undertaken only after signed agreements to continue the grazing practices necessary to safeguard the public interest have been secured from the individuals using the range.

*Relation to Regional and Functional Plans.*—Project proposals that are presented as parts of broad area programs should receive favorable ratings. Preferred status may be given projects which form an integral part of the operations of governmental agencies, Federal, State, or county.

Range public works should be in accord with desirable trends in the regional range livestock economy. Projects which impound large quantities of water or appreciably retard water flow should be in accord with water conservation and development plans for the watersheds in which they are located, and should conform to the laws of the State governing water use.

Range projects whose primary purpose is the saving of the range resources or the protection of valuable valley lands and improvements from destruction by excessive run-off from upland ranges ordinarily should have first priority. Works contributing directly to the effectiveness of management of Federal lands by Federal agencies would stand high on the list of priorities in a Federal public works program, though in areas of intermingled ownership, range programs, to achieve optimum value, must deal with lands in public and private ownership alike.

Public works projects on range lands are admirably suited to the type of public works program which is aimed at employment stabilization. They can be started and stopped on short notice, as unemployment increases or decreases. They cover a wide field of employment opportunities, and use much unskilled labor. Materials used may be those which would stimulate employment in distant centers or employ large numbers of unskilled laborers on the project site. For example, culverts in truck trails may be of corrugated iron, concrete, or hand-laid local rock.

### Forest Lands

One of the richest of our natural resources has been our forests, which originally occupied almost half, and still occupy one-third of the land area of continental United States. Throughout our history, wood in its various forms has been an essential material for housing and for a multitude of other uses in homes, on farms, in mines, and in transportation and manufacturing industries.

Forests also serve us in other ways than as sources of wood. Forest cover on our hill and mountain land is essential to preserve the soil, to maintain regular flow of rivers, and to assure adequate supplies of water to agriculture, industries, and homes.

Forests create pleasing landscapes, ameliorate local climate, and afford opportunities for health-giving physical and mental recreation. Forest ranges are closely integrated with the economic welfare of thou-

sands of stockmen in the West and to farmers in the South and East. Forest cover forms an important habitat for wildlife.

Exploitation of the forests and utilization of their products and services during three centuries have been characterized by a prodigal use of these resources, without adequate provision for their maintenance or renewal. This prodigality perhaps was to be expected during the pioneer era, but the Nation is now mature and must assume the responsibilities of maturity. These include the obligation to establish, through rehabilitation and good management of the forest resource, a more solid foundation for the present and future livelihood and welfare of the people.

A program for establishing a sound, permanent forest economy in the United States requires, among other things, large capital outlays in rehabilitating and improving the forests, as well as large current expenditures for their protection and management. The physical improvements, largely nonrecurring investments which add to the value of the Nation's productive plant, form the basis of a comprehensive public works program for forest land offered by the Department of Agriculture and the Department of the Interior. This program involves forest fire protection, construction of forest roads and trails, forest planting, forest stand improvement, prevention and control of insects and diseases, watershed protection, provision of shelterbelts in the Great Plains, and construction of buildings for administrative and research purposes.

#### Evaluation Criteria for Forest Works

Requirements enumerated for the general forestry works program are useful in evaluating proposals for individual projects or programs. For example, it is pointed out that the character of the work that can be justified on a given forest area depends upon how intensively the area needs to be managed to produce the goods and services that the public interest demands. Furthermore, forest activities must follow an orderly sequence. They should form a part of a long-time, continuous program, which must be based upon adequate fundamental research and surveys. A program of forest works should be kept in balance among the various forest regions and locally within each region. It should be coordinated with land-use programs in fields other than forestry.

Evaluation of individual public works proposals on forest lands may be considered under: (1) Costs and benefits, (2) timing, (3) location, and (4) financing.

**Costs and Benefits.**—A public works project on forest land should be essential to and in conformity with the general forest activity program. The total of expected benefits, both direct and indirect, monetary and non-monetary, should be greater than the total costs, and

the expected benefits to the public should exceed the public costs. For some types of projects, fairly definite formulae have been worked out for the cost-benefit relationship. For example, the measure of benefits from forest fire protection is the amount of loss that would occur without it, and it is possible to make reasonable estimates, on the basis of fire records over many years, of the extent of this loss. Thus, expenditures for forest fire protection works projects are justified up to the point where a further increase in expenditure is not balanced by a reduction in fire losses. Similarly, some calculation of probable returns in increased timber volume might be made for forest planting or other forms of forest stand improvement.

Benefits of forestry projects, however, consist only in part of goods and services which are commonly bought and sold and which therefore can be appraised in the market sense. They include also indirect and nonvendible returns which are difficult to appraise objectively because recognized guideposts like market prices are wanting. Works project proposals in these fields therefore should describe such benefits in sufficient detail to enable the evaluating body to form its own subjective judgment as to how much weight should be assigned to them in considering the project.

Projects should be technically sound, and backed by adequate investigation and research. Qualified supervisory and technical personnel and adequate equipment should be available for finishing the work. There should be reasonable certainty that provision will be made for maintenance.

**Timing.**—Proper sequence of operations is important in timing forest public works. Certain work should be done at a certain time as an essential follow-up of work already done, or as a prerequisite of work to be done. For example, if nursery stock has been grown to the proper size for field planting, a planting project is in order; or if the program calls for planting a given area within the next few years, production of the nursery stock will have to be undertaken first. In some areas it may be desirable to give immediate priority to work that will result in early benefits. Work should be undertaken, when other conditions permit, at times when it appears that it will cost the least. So far as possible work should be timed to provide the type of employment that is most needed.

Emergency situations may upset the ordinary process of timing projects by demanding that certain work be done immediately to prevent loss of lives or property, or to repair damage that is seriously disrupting the forestry program.

Retention of trained personnel and effective use of specialized equipment are important factors in project timing.

**Location.**—Other things being equal, projects that

will benefit existing industries and communities that have a reasonably promising economic future should take precedence over projects that would benefit industries and communities that might be established in the future.

Consideration should be given to local need for the type of employment that would be provided by the project. Projects in areas where the population is largely dependent upon the forests, and where large-scale public action is necessary to insure that the forests will continue to provide employment, stand high on the priority list.

A vital consideration in locating a project may be a critical local situation, such as a high fire hazard, or a denuded area that may, if not reforested, cause a serious flood or the siltation of a reservoir.

Special consideration should be given to forest works in Alaska, because of its strategic location.

In locating some types of forest projects, the attitude of the people in the locality may be an important factor.

Projects on public lands or on privately owned lands over whose use the public has a considerable degree of control, either through agreement or through legislation, are preferred over projects on uncontrolled privately owned land where there is no assurance that the forests will be handled in such a way as to permit any public benefits to be realized from the project.

*Financing.*—It is generally recognized that the public should carry out and pay for most of the necessary works on lands in permanent public ownership, except such construction as temporary logging roads and sawmills required for private utilization of the timber under contract, or summer homes and camps used by individuals under lease or permit. The Federal Government should be responsible for work on Federal lands, and State and local governments should be primarily responsible for work on their lands, but where substantial national interests will be promoted by a project on State or county forest land, the National Government should share the cost.

Government responsibility for participation in the protection and development of forest lands now in private ownership arises whenever the owners cannot manage their lands in the manner which the public interest requires. This situation has been recognized in provisions for public financial contributions to cooperative fire protection, control of forest insects and diseases, demonstration projects in farm woodland management, distribution of low-cost trees for planting, cooperation in establishing shelterbelts, and benefit payments for forest planting and woodland improvements.

As suggested above, any large public expenditures on private forest land should in most instances be contingent on arrangements to assure that sound conservation

practices will be applied in the future so that the expected public benefits will not be jeopardized by action of the owner.

### Recreational Lands

Recreation must be considered as an integral part of any land management conservation program and a human requirement for productive efficiency and health. The general objective of a recreational program is to provide all forms of recreational opportunities, by means of public and private effort, to meet the needs of all people.

Land is necessary for all recreation and is required in relatively large amounts for outdoor recreation. The United States has large acreages of land available for this purpose. There are available for development for recreational use upwards of 300,000,000 acres, or almost one-sixth of the area of the country.

The objective of a public works program in the recreational field is to acquire or reserve, and to provide improvements on, as much of this land as is needed to place adequate recreational facilities within reach of every citizen. A program for outdoor recreational development suggested by agencies concerned with recreation, includes the following specific requirements:

In urban areas there should be neighborhood playgrounds within easy walking distance (not more than a quarter of a mile) of all children; playfields and neighborhood centers within half a mile of all citizens; parks or other areas characterized by natural or man-made beauty, sufficient in extent so that wear and tear will not be such as to render the cost of maintenance of their attractive features prohibitive, and sufficient in number so that all citizens may enjoy them occasionally; protection of urban and suburban streams from pollution and "uglifying" uses; and parkways along waterways to connect major units of the recreational-area system.

For holiday and week-end use by city people and by those who live in thickly populated or intensively cultivated rural areas, there is need for public recreational areas where picknicking, water sports, day and overnight camping, hiking and other related activities may be enjoyed, and which are sufficiently large to provide those who use them with a sense of freedom and of separation from crowds. At least one such area should be located within 25 miles of those for whom they are chiefly provided. Somewhat similar facilities, probably more widely spaced, likewise are needed by residents of more sparsely populated rural areas.

For vacation use by all the population there are needed extensive public holdings in all those parts of the country characterized by forests, rugged terrain, lakes and streams, or any combination of these characteristics. In those areas where mountainous and other wilderness areas are not available, there should be pro-



vided, wherever possible within about 200 miles of all urban centers, recreational areas possessing an interesting terrain, fair forest cover that will steadily improve under proper protection and management, and flowing waters valuable for a variety of recreational uses.

Because of the extraordinary recreational value of ocean, lake, and river frontage, there should be provided for recreational use an adequate proportion of the country's ocean frontage, of the shore line of the Great Lakes, and of the shores of other major lakes and streams. Distribution of these areas should be directly related, so far as possible, to the distribution of the population.

Areas containing scenery of such outstanding distinction as to attract users from considerable distances and in fair numbers should be in public ownership and developed for public recreational use. These are the areas such as make up the national parks, national recreational areas, wilderness areas, and some of the State parks. On the same plane with the scenic areas are areas or structures of outstanding historic, prehistoric or scientific significance.

For specific recreational uses, parkways, trailways, routes of water travel, and wayside resting places along major highways, suggest themselves as important in rounding out and completing our public recreational system. In addition, certain public works, such as mosquito control, on privately owned land may facilitate the development of land and water areas for recreational purposes. Additional highway construction frequently is required to make newly developed recreational areas, both public and private, accessible to centers of population. Educational or demonstration projects in the construction and operation of inns, taverns, and service stations along trunk highways between centers of population and large recreational areas might serve to improve such facilities and services under private operation, and thus increase the popularity of such areas.

Agencies concerned with recreation at all levels of government should be encouraged to acquire lands as rapidly as their need is determined. Advance acquisition not only places an agency in a position to take advantage of a works program but it also frequently means a considerable saving in the purchase price.

#### **Evaluation Principles for Recreational Projects**

While the principle that benefits should exceed costs applies to public works projects on recreational land as well as to those on other types of land, determination of the benefits of recreation in monetary terms is difficult. Public works in the recreational field increase the

national well-being through development of recreational resources and provision of recreational opportunities. There are also indirect benefits, such as watershed and wild-life protection, provision of permanent employment, stimulation to business in neighboring communities, and increase in value of adjoining lands. Although these benefits have a real economic value, no method as yet has been devised to measure them in dollars and cents. If it is determined that the preservation of a particular area is in the public interest or that the provision of certain facilities is required to meet the recreational needs of a given community or region, then reasonable expenditures to accomplish such ends are justified. A public works project proposal for recreation should make a reasonable showing of the necessity for preservation of a particular area, however, or should show that a project for provision of recreational facilities will be justified by full use.

In the field of technical soundness, the adequacy of plans and supervisory personnel, the availability of materials and equipment and the ability of the administering agency to operate and maintain the developments are of first importance.

Recreational public works of course should be coordinated with public works programs in other fields. There are frequent opportunities to provide needed recreational facilities in connection with power, irrigation, flood control, forestry and wildlife projects, with relatively little additional expenditure.

In rural areas, high priority should be given to the preservation and protection of outstanding natural recreational resources, where such resources are in danger of destruction or loss to the public. In urban communities, playgrounds for children in congested districts, small in-town parks serving as rest and relaxation places in congested districts, large parks for driving, picknicking, golfing, etc., and parkways ordinarily should stand in the order named on the list of priorities.

The Federal Government should bear the cost of recreational development in areas which qualify as national parks and monuments, and in other Federal areas, such as national forests and wildlife refuges. The States should bear at least the greater portion of the cost of acquisition and development of recreational areas that are patronized primarily by their own residents. Local governments, including all political subdivisions of the State, should be responsible for supplying and administering day and week-end recreational facilities for local residents. Federal aid and cooperation often are desirable, however, to make available to them the benefits of the findings and experience of Federal agencies and other States, and for the purpose of providing adequate recreational facilities where local governments are financially unable to do so.



### Land and Water for Protection and Development of Fish and Wildlife

Since the earliest settlement of this country, the natural abundance of wildlife has played a vitally important part in providing food and in satisfying an ever increasing demand for furs. More recently, the sport of studying or of taking wildlife has grown into an industry of considerable importance.

Within recent years the natural supply of wildlife has been seriously depleted by increased use of land for agricultural purposes, by destruction of valuable fishery resources through water pollution, by steady drain on seed stock through a continued take in excess of natural increase, and by the severe droughts of 1934 and 1936 and the attendant elimination of vast areas of normal wildlife habitat.

The principal requirements of wildlife in the United States are the rehabilitation, development, preservation, and protection of suitable places for it to live. Fortunately, as these habitats are restored and hunting and fishing are held within reasonable bounds, wildlife increases.

The objectives of a wildlife conservation program for the Nation, therefore, are to preserve an adequate seed stock of wild animals in nature and to restore, develop, and protect a satisfactory environment to insure their preservation. Such a program involves a comprehensive system of public works, including dams, dikes, and water control structures necessary to establish permanent marshes and open water conditions for waterfowl and other migratory birds; fences to control grazing and trespass and to protect fully the lands against poaching and other unauthorized uses on big game, upland game, or waterfowl refuges; roads, trails and fire lanes to facilitate administration, patrol, fire protection and proper use of the lands; administration buildings, telephone and power lines; and food and cover plantings to establish optimum habitat for all species of wildlife. The Departments of the Interior and Agriculture, as well as the fish and wildlife agencies of the various States, are especially concerned with this program.

#### Evaluation Factors

Most structures and other improvements for protection and development of wildlife are relatively simple and the costs are low in relation to the acreage involved. Many of the benefits of wildlife public works are intangible. They result, however, in definite

contributions to important commercial industries. The investment in the fisheries industry is approximately 1 billion dollars. Production of fish totals about 4 billion pounds annually, worth 90 million dollars to the original producers. The annual catch of furs is estimated at 40 million dollars. Sportsmen paid almost 13 million dollars for licenses in 1939, and it is estimated that their annual expenditures for license fees, transportation, and other items amount to nearly 200 million dollars.

Wildlife conservation works at times also have beneficial effects on water conservation, soil erosion, and flood control, and insect and rodent control.

Provision of adequate reserve water supplies to maintain nearly constant water depth in ponds and marshes for fish and waterfowl, is highly important. Erosion on nearby lands should be controlled; otherwise the resulting turbidity of the water will retard or eliminate the aquatic plants that furnish the food supply. In the production of big game and upland game in semiarid regions, adequate drinking water supplies are needed.

Combinations of public works projects for wildlife protection with those for other purposes frequently prove economical. In fact, a large part of the public works necessary for wildlife can be carried out most successfully in conjunction with other types of projects, such as those whose major purpose is forest protection and development, soil, moisture, and range conservation, and irrigation. A review of proposed public works project proposals involving water impoundments will frequently permit modifications of the original plans to provide for controlled water levels and cover planting that will aid materially in wildlife conservation.

In the determination of priorities for public works projects in the wildlife field, primary consideration should be given to publicly owned or controlled areas, such as Federal and State game sanctuaries, on which development is necessary to make the land produce and maintain maximum wildlife populations. Projects designed to save wildlife species from extinction or to provide food or supplementary income for families in low-income areas, should stand high on the priority list.

Fish and game usually are considered public property until taken; therefore a high degree of public participation in their preservation and development is justified. Since birds and many varieties of fish migrate over vast areas, the responsibility of the Federal Government in financing public works projects for these types of wildlife is relatively heavy.

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## PART III

### 6. WATER PLANS FOR DRAINAGE BASINS<sup>1</sup>

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After the War, the United States will again turn to "upbuilding America" including the development of our water resources for human use and enjoyment. The present war program emphasizes the need for planning now so that the many water projects needed for defense can be rushed to completion as a part of the war effort. Every practicable effort must be made to insure development of these projects so that they will serve their immediate purposes without delay and at the same time be of the greatest possible usefulness after the emergency has passed. The projects which must now be postponed until funds, materials, and labor are available after the war effort, can be planned now to form part of a soundly conceived program of public works which may be undertaken promptly as war employment diminishes.

The National Resources Planning Board, with its predecessors, through the Water Resources Committee, has stressed the importance of planning for the full use of the water resources of drainage basins, considering each basin as a whole. A second principle which it has recommended is multiple-purpose planning to combine the fulfillment of various functions in the same structure and design.

#### Problems and Opportunities

Every drainage basin or closely related group of basins has its individual combination of problems and water uses. These water problems and uses include: (1) Navigation, (2) flood control, (3) protection against droughts, (4) needs for irrigation, (5) needs for water power, (6) drainage, (7) water flow retardation, (8) reduction of erosion and siltation, (9) pollution abatement, (10) domestic or industrial water supplies, (11) recreation, (12) fish and wild life, etc.

The solution of these problems and the most effective use of these water resources provides one of the principle opportunities for constructive activity in the United States after the war effort. We know by experience that the usefulness and effectiveness of projects for river or drainage-basin development are measured by the amount and adequacy of the planning and cooperation among those concerned before construction is begun.

If plans are to be made covering the various functions of a whole drainage basin the problem of coordination of special interests often becomes an important respon-

sibility. To provide such coordination, and to secure reasonable agreement upon objectives, various approaches to the problem have been made during the last 8 years. These approaches have drawn upon Federal, State, and local agency experience gained over a much longer period. To summarize the results of past experience and to indicate desirable possibilities and procedures for more widespread use and future use in basin planning is the purpose of this statement.

#### Objectives and Procedures

The objective of any drainage-basin plan is a clear statement in words, maps, or graphs of the most economical and effective use of the available water and related resources, with an indication of the types of structures and projects which should make up the plan. A drainage-basin plan should picture for the inhabitants of the basin the way in which its water resources would be used under conditions of their full development for the largest sum of human benefits. The plan should, of necessity, indicate some natural sequence in order of importance or order of time in which the several parts of the plan might most appropriately be undertaken.

Such a plan cannot spring from desire and imagination alone. Pains-taking effort utilizing the best skills and knowledge is also required so that it may be based upon sound facts properly related. The plan must grow in solidity through recurring correction. It must be adjusted accordingly from time to time, not only during its preparation, but also during its execution. It is at no time static. Adjustments or changes of emphasis may always be necessary. The probable success of any basin plan depends upon recognition of these facts during its preparation, and upon provision for flexibility of concept during its preparation and administration.

In order to establish a well-balanced plan, it is necessary first to bring together, in appropriate succession, the minimum factual information of all kinds which is essential to identify the major problems of the basin, and to determine their general relationships. Having thus determined the controlling factors, beginning with the least complex, questions may be developed, the answers to which will permit the successive decisions which must then be made. The success of this approach depends not only upon the adequacy of the questions, but equally upon the perception used in directing them to the best sources of information and in keeping the

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<sup>1</sup> Submitted by the Water Resources Committee of the National Resources Planning Board.

objectives oriented and within focus. The factual data required in drainage basin planning is, in large part, directly concerned with water; but much of the data equally essential is concerned with the use of land and the way of life which the people of the area now enjoy and that to which they may reasonably look forward.

The Congress, State legislatures, and private institutions have set up numerous research groups and agencies to collect necessary factual information. They measure the flow of streams, estimate the stores of ground water and its quality, prepare topographic maps, record the trends of population, of industry, the problems of individual areas, and numerous other special factors which make demands on water. Similarly, numerous functional agencies have been established to prepare projects and plans in their special fields. The basin plan should grow out of these data, and the qualified judgment of all functional agencies concerned should be combined in one all-purpose proposal which will permit development toward the optimum use of basin resources.

Five specific steps are necessary to assure preparation and maintenance of a sound plan for basin development:

- (1) Identification of the water problems, and of the possibilities of water resource development, which are the most urgent in the basin; and adoption of a continuing program leading toward the clarification of them, and to an ultimate decision with respect to their feasibility and propriety.

- (2) Determination of objectives of a basin plan.

- (3) The collection and interpretation of basic data, and investigations which are considered pre-essential to conclusions with respect to the water plan for the basin.

- (4) Formulation in broad outlines of development plans for the best use of all the water resources of a given basin.

- (5) Translation of the plan into projects and proposals, properly related to the best use and control of water in the basin.

*Adequate analysis of the problems* of water use and control in each basin, from the basin and regional points of view, is the only sound basis on which to conceive projects which will contribute to the most satisfactory solution of a series of interrelated problems. A general investigation of the basin should therefore be made as the first step in the identification of those problems which involve water use or water control. The natures of the several problems and the areas which they affect most seriously should be determined, along with the relations between the areas. From that general identification should follow a series of specific studies to obtain data which will establish the relative magnitude and urgency of each of the individual prob-

lems, and their relative effect upon the social and economic structures of the basin. These studies should utilize particularly the research agencies and should preferably be made available on an agreed time schedule.

*The objectives of the plan* should be expressed in quantitative terms which are as specific as available information permits. They should indicate clearly the functions to be performed in each area in the basin. For example, if the dominant problem in a basin is need for irrigation, hydroelectric power in two areas, and flood control for known reaches of the main stream; and if the resources of the basin are such that facilities for providing them appear practicable, then it is possible to determine the amounts and locations of the most suitable and economical storage capacity together with the most favorable type of regulation to meet all demands. The statement of the objectives, with a real and quantitative definition, forms the first general outline of the drainage basin plan. While at this stage certain parts of the plan may necessarily need further clarification, it will provide a general framework within which later and fuller information may be fitted. It will provide a basis for judging the relative weights to be given to the different water needs and to the possibilities of alternative uses of the water and the extent to which any two or more uses may be inconsistent.

*The collection of basic data* which is needed in specific cases must be founded upon concepts at least as broad as the objectives of the projects concerned. The usefulness of these data in any case depends upon exercise of proper judgment of the scope and degree of detail warranted. Many agencies, private and public—at all levels of government—will have data, or personnel and equipment for gathering pertinent information. The organization of the fact-gathering phase of the planning process requires in itself a high degree of planning and organization.

*The formulation of the basin plan* follows from the general statement of objectives. The public and private agencies concerned in the preparation of the water plan for a basin should bring their expert judgments and facilities to bear first on the drafting of the separate elements of the plan, second on the combining of those elements into a single plan or program for the basin, and third on the fitting of that plan into the regional and national pattern of resource development. This is a codifying process in which the practicability of each of the objectives must be considered separately and in combination in the light of known conditions. If suitable consideration is to be given all factors, it is necessary to schedule preparation of the individual studies. To accomplish this, the administrative, financial, and technical structures of each of the agencies must be understood by all participants. This procedure

should provide a balanced and practicable basin plan, complete in its key elements, yet sufficiently flexible to permit desirable changes in emphasis as the program is put into effect. Periodic reconsideration of the plan may be necessary in any basin.

*The final step*, that of translating the basin plan into actual projects, is likewise a continuing process and should start the moment that the first tentative agreement on objectives is adopted. Two intermittent activities are involved. The surveys and planning operations which are undertaken by Federal, State, or local agencies should be coordinated, and their relation to the plan for the basin should be determined in each case.

In addition, wherever it is practicable, the scope of these individual investigations should be broadened so that they will contribute most effectively to other elements in the basin plan. Coordination of project plans is least difficult when the investigation reports have been previously considered and are known to be consistent with the general water plan for the basin.

In all these steps the National Resources Planning Board through its Water Resources Committee, the Drainage Basin Committees, and the water consultants, serves as the agency to coordinate the water planning activities of both the regularly constituted governmental and private agencies. Thus it facilitates the development of coordinated water plans through full cooperation of these agencies.

### Inter-Agency Cooperation

A preliminary investigation to identify problems, was undertaken by the Water Resources Committee for all of the drainage basins in the United States in 1936. The resulting report of the National Resources Committee on "Drainage Basin Problems and Programs" brought together the reports of regional water consultants who had collaborated with State and Federal agencies in assembling pertinent factual data which were then available, and set-out the consultants' conclusions as to the nature and relative importance of the water problems in the basins.

During the following year 45 working "Drainage Basin Committees" were established. The areal coverage of these field committees includes the entire continental United States. Each is composed of field representatives of the Federal and State agencies most concerned with the particular water problems of the basin (or group of adjacent basins) to which the committee was assigned. All of the members are identified with some phase of the water field and have knowledge of local conditions. The water consultants—generally those who developed the preliminary reports—are assigned to work with these committees as technical advisers and coordinators.

The distinctive function of the Drainage Basin Committees is to bring together and unify the local, State, and Federal points of view in the field with respect to the water problems in their areas. They are not organized to perfect plans in detail, but rather to discover possibilities, and to stimulate investigations necessary to the formulation of general plans and programs. Their work is predicated upon continued cooperation of the local, State, and Federal agencies.

Each Drainage Basin Committee is seeking to formulate for its basin a systematic plan (in contrast to a mere listing of projects) for the best use and control of surface and underground waters. It is hoped that the plan for each basin will:

- (1) Complement, as far as practicable, any well-considered plan of land utilization.

- (2) Give due weight to all important water uses, present and prospective, and to effective water control.

- (3) Recognize and provide, if practicable, for all relevant local needs, but be concerned primarily with needs which are of basin-wide and regional importance.

- (4) Be drawn first to meet the requirements of the basin itself, but then be adjusted equitably to regional water requirements.

- (5) Provide maximum aggregate benefits at the lowest cost consistent with the objectives.

To these ends the committees have reviewed and in most cases extended the basin reports previously prepared by the water consultants. In addition, many of them have undertaken a formal and systematic program to supply the additional factual information which was found to be essential in order to define the objectives of the initial basin plans. In a number of cases valuable contributions have been made by this process. The committees in the Missouri River basin, for example, assembled what still stands as the most complete summary of existing knowledge on water supplies and water demands in their basins.

In most cases, however, the committees found that the deficiencies in basic data were so great that their agency staffs and available funds were not sufficient to supply them. Their reports on these deficiencies, when assembled in Washington, showed clearly that orderly progress toward supplying this essential foundation for any water development plan depended mainly upon better coordination among Federal departments in Washington. They indicated that coordination was needed in standards, in coverage, in timing, and in budgeting. In this case, as in other similar circumstances, the Water Resources Committee established a Special Advisory Committee on Hydrologic Data, made up of representatives from the major Federal agencies which collect these data, and engineers representing the outside public who depend upon their use. They

analyzed the problem on a national scale,<sup>2</sup> and contributed much toward advancement in this fundamental field. Because of the great strides which have been made in the use of hydrologic data during the past several years, the adequacy of basic data is becoming increasingly more important. Consequently, this subcommittee is now reconsidering the problem so that improved data may be available for the wise planning of works in this field which may follow the emergency.

The Regional Offices of the National Resources Planning Board play an essential part in this water planning procedure. Since their work covers all phases of regional planning, of which water is one, it is their particular function to bring essential water considerations into the regional plan, and to collaborate with the water consultants to the end of insuring appropriate recognition of other problems in the formulation of water plans. In addition, the Regional Offices have handled the administrative duties involved in the operation of the Drainage Basin Committees, thereby freeing the Water Consultants to devote their primary attention to matters of technical guidance and water planning.

The "Three Party Agreement," a procedure established in 1939 between the Corps of Engineers, the Bureau of Reclamation, and the Bureau of Agricultural Economics, can substantially advance the clarification of interagency as well as basin problems. It provides for inter-change of information which any of the agencies obtain on multiple-purpose projects, in which the others find an interest, and provides for liaison service primarily by the Water Consultants of the National Resources Planning Board.

The Water Resources Committee serves to improve collaboration. It is composed of responsible officials of Federal agencies and consultants appointed from various sections of the country. The agencies represented by the Federal members are responsible for a large portion of Federal planning and construction of water projects; the consultants are all identified with the field of public and private works. This committee, with its subcommittees of specialists from Federal, State, and private fields of endeavor is therefore especially able to contribute in:

- (1) inter-agency coordination on specific or general problems.
- (2) special studies of national importance to supplement the work of the drainage basin committees.
- (3) collaborative development of policies.
- (4) implementation of those policies.

Inter-agency discussion of specific problems or projects is conducive to development of a more complete understanding of the relation between basin problems. As a result of such discussions the objectives of the

most desirable basin plan are brought to light and related properly. It is then possible to prepare and execute projects which will be most useful from all points of view.

Through the operation of the Water Resources Committee, as an integral part of the National Resources Planning Board, cooperation is maintained with other similar clearing house operations within the Board which deal with problems of Land, Transportation, Industrial Location and Energy. Additional facilities of the Board on employment and employment trends, on the status of Federal investigations, construction and legislation, and on problems of public relief are also available. The effectiveness of this clearing house is two-fold. It is seen through its direct collaborative actions, and through the almost equally important translation of information and concepts directly from the meetings to the agencies, through the participating agency and representatives.

### Water policies

One of the most important functions of the Water Resources Committee is in the essential field of policy. The composite point of view which it makes possible has done much to align the actions of all agencies and interests engaged in preparing plans for water use and control. The National Water Policy, published in January 1941<sup>3</sup> represents a major contribution along these lines.

The committee recognizes that policies, like basin plans, change with human needs and must be kept up to date to serve as a sound guiding principle. It therefore recognizes the necessity of reconsidering such a policy statement at indefinite intervals as required, in order that it may at all times be of most value to the Federal, State and local governments, and to the nation as a whole.

Subcommittee and special activities are briefed in the following, and indicate the operating policies under which the Committee lends its assistance to the preparation of plans, and to agreement on policies.

*National Water Policy.*—Definition of essential elements in a sound national policy, and recommend changes necessary to attain that policy.

*State Water Law.*—Recommendation of principles to guide revisions in State water laws, which affect every Federal, State and local projects, with summary of statutory laws.

*Water Pollution.*—National policy for pollution abatement and statement of pollution abatement program.

*Hydrologic Data and Research.*—Deficiencies in hydrologic data and research. Policies which should

<sup>2</sup> "Deficiencies in Basic Hydrologic Data," National Resources Committee, 1936; "Deficiencies in Hydrologic Research," National Resources Planning Board, 1940.

<sup>3</sup> "Development of Resources and Stabilization of Employment in the United States," National Resources Planning Board, January 1941, p. 371. House Document 142, 77th Cong., 1st Sess.



govern collection and dissemination. Availability of records. Standardization of nomenclature. Review of programs.

*Small Water Projects.*—Discussion of factors pertaining to small projects whose individual effects are usually small but whose cumulative effects are often large.

Emphasis on what to consider and why, wherein and how it is related to other works and plans, rather than on how to build. This latter question has been previously reported upon in the field of small dams.<sup>4</sup>

*Evaluation.*—Consideration of individual projects to ascertain their relation to basin needs and plans, and to national policies and interests.

*Investigations.*—(a) Rio Grande—cooperative study of inter-state problems through a consulting board, using Federal and State cooperation.<sup>5</sup>

(b) Pecos River Basin—cooperative study of inter-state problems, through a consulting board to determine facts essential to formulating inter-state compact, and preparing plans for control of salinity, silt and floods.<sup>6</sup>

(c) Platte River Basin—Preliminary consideration of practicability, desirability, scope and probable cost of inter-state joint investigation.<sup>7</sup>

(d) Gila River Basin—cooperative study of intra-state effects of Federal programs on water use and control.<sup>6</sup>

(e) Southeastern Florida — cooperative study of ground-water supplies, soil conservation, navigation and their interrelations.

In addition to the above, important contributions have been made by subcommittees on Flood Damage Data, Drainage Policy and Projects, Ohio-Lower Mississippi Program, Silt and Salinity and Vegetal Cover and floods.

Committee, consultant and staff assistance is given toward the objectives of action programs such as the Water Facilities Program (small, scattered water supplies) and the Wheeler-Case Program (rehabilitation-irrigation).

Special subcommittees are established as required to advise on matters of current importance, whether temporary in character or parts of a continuing effort.

In connection with consideration of proposed Federal projects for civil improvements not directly related to the war, the Water Resources Committee, through

<sup>4</sup> "Low Dams, a Manual of Design for Small Water Projects," prepared by the Subcommittee on Small Water Storage Projects of the Water Resources Committee of the National Resources Committee, published in 1938.

<sup>5</sup> "Regional Planning, Part IV—Upper Rio Grande," National Resources Committee, 1938. Inter-state Compact has since been adopted.

<sup>6</sup> Work in progress.

<sup>7</sup> Work in progress at joint request of Governors of Colorado, Wyoming and Nebraska.

its Evaluation Subcommittee, has already recommended that detailed construction plans be prepared as soon as practicable for more than one hundred and fifty projects which do not conflict with any other known national, State, or local development plan, and which are in harmony with basin needs.

### After-the-War Program

Programs of projects for water use and control must inevitably, as heretofore, form a substantial proportion of the post-war public works program. It is impossible to prophesy how soon such a program will be needed. However, it is recognized that concerted efforts by Federal, State, and local groups will be necessary to have such a program in effective working condition by the time it is needed.

In the planning of the individual water projects which may be proposed as parts of a post-war program, among other considerations, attention should be given to factors which did not pertain to the recent depression period. The availability of particular products which go into the design of the projects, or the ready availability of suitable types of labor skills may influence the time at which the individual projects may be undertaken. Unless these factors are considered in the planning and programming of post-war projects, individual projects may be thwarted. Similarly, unless the planning and programming is adequate, the benefits from individual projects may be impaired or even nullified due to the offsetting effects of other projects. To make this effort nationally most productive, adequate water plans should be available for each basin so that the actual needs for particular projects or services may be determined by comparison with them.

Especial effort may be required in the fields of water-power, pollution abatement, water supply, local navigation and flood control, and multiple-purpose projects which pertain to these problems and are related to other locally important problems. A clear and convincing presentation of the water plan for each basin is an immediate need. Prompt action should therefore be taken to complete detailed and specific statements of these plans.

Provision should then be made for their use in correlating projects proposed as segments in the post-war transition program, whether they are Federal, State or local in character. Funds should be made available for the preparation of such detailed plans and specifications as are essential to make the program flexible and effective.



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## PART III

### 7. URBAN CONSERVATION AND DEVELOPMENT \*

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Although problems of rural living had been explored systematically as early as 1909, when the Country Life Commission reported to President Theodore Roosevelt, the first broad study of the place of cities in the national scheme of things was undertaken by the National Resources Committee in 1935. The report of its Committee on Urbanism, *Our Cities—Their Role in the National Economy*, appeared in 1937.<sup>1</sup>

In its foreword to this report the National Resources Committee called attention to a dozen or more emerging problems of cities, approved in principle 11 major suggestions of the Urbanism Committee, and outlined 5 possible accomplishments of the proposed program:

1. Improvement of the standards of urban life and raising of the level of living conditions.
2. Elimination of urban blight and erosion and, above all, of the slum; restating urban conservation in terms of human values.
3. Achieving a nationally organized system of urban reporting and research.
4. Better planned urban industrial location and development, leading to a better national economic balance.
5. National-urban preparedness to meet insecurity and unemployment.

It is gratifying to note the progress made in less than 5 years toward carrying out the Urbanism Committee's suggestions. Accomplishments have been particularly noteworthy in the areas in which Federal action was recommended. Thus, a National Resources Planning Board has been made permanent, a Federal Loan Agency and a Federal Works Agency have been established with powers to aid cities in public-works planning and construction; the attack on the slum has been accepted as a Federal responsibility; studies have been undertaken by the National Resources Planning Board of industrial plant location, of transportation, of power, and of relief and welfare policy; a comprehensive study has been initiated by the Treasury Department of conflicting fiscal policies and taxation in local, State, and Federal Governments. There has been a tremendous impetus to the accumulation of facts about cities and to the study of urban land problems by such diverse agencies as the Federal Housing Administration, the Federal Home Loan Bank Board and Home Owners Loan Cor-

poration, the United States Housing Authority, the Public Buildings Administration, Public Roads Administration and the Work Projects Administration, the Bureau of Home Economics, the Bureau of Labor Statistics, the Bureau of Foreign and Domestic Commerce, the Bureau of the Census, the Social Security Board, and the Bureau of Internal Revenue—some of which did not even exist when the Urbanism Committee made its study.<sup>2</sup>

These suggestions could not have been translated into action unless there had been widespread recognition of the urgency of the problems posed by the Urbanism Committee. Since its report, the deterioration of the urban environment has been pictured graphically in Real Property Inventories in over 200 cities. The Census of 1940 has hammered home some basic facts of recent urban development.

We know, for instance, that 56.5 percent of our population lives in areas defined by the census as urban (of 2,500 population or over); 47.8 percent of it in 140 metropolitan districts recognized by the Bureau of the Census. Yet in the past decade the rate of growth of our great metropolitan centers has slackened off: of the 11 greatest, all have had some population increase, but not much. In only 4 has the central city increased more than the suburbs; in 4 others the suburbs have had the greater increase; in 3 the central city has definitely lost population. The suburbs themselves have not gained as many residents in the past decade as in the 1920's. The publication of the census data has furnished an occasion to emphasize to the public that which students of the subject have tried to tell them for some time: that our national population is approaching stabilization during this generation.<sup>3</sup>

The international crisis has given a new intensity to our thinking about the future of cities. In Great Britain the impetus seems to be the desolation wrought by enemy bombers; it has led already to organization for post-war rebuilding of cities. Yet the facts suggest that this is basically a spiritual release: except for a few places like the centers of Coventry and Plymouth, the physical destruction has been too sporadic to offer substantial cleared areas for comprehensive replanning. And even though the United States hopes to be spared

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\*Prepared by Charles S. Ascher, consultant to the National Resources Planning Board.

<sup>1</sup> Supplementary volumes, containing selected supporting studies, followed in 1939. Vol. I, *Urban Government*; Vol. II, *Urban Planning and Land Policies*.

<sup>2</sup> See Central Statistical Board, *Construction, Housing and Real Property—A Survey of Available Basic Statistical Data*. 1940.

<sup>3</sup> See National Resources Planning Board, *The Problems of a Changing Population*.

the rain of death from the sky, there is the same ferment at work here: the determination that the communities of the future must be nobler embodiments of the democratic respect for the worth of the individual, if our war effort is to be justified. The place of city rebuilding in post-war planning for full employment, security and upbuilding America has been stated recently in the National Resources Planning Board's pamphlet, *After Defense—What?*

There have emerged as resultants of these forces certain leading ideas about the rebuilding of cities which today as never before seem to have the adherence of social scientists, groups of property owners, and of public officials. The National Resources Planning Board sets them forth as guides to its own program of urban conservation and development.

### Large-Scale Rebuilding

The first and central idea is that the replanning and rebuilding of cities must be on a large scale: the isolated, uncoordinated, replacement of a group of structures here and there will not do. If performed under public auspices, it will not be acceptable to the citizens either as a satisfactory expenditure of their funds or as an adequate realization of what they hope their government will do for them. If carried on by private enterprise it will not be economically supportable.

Before we undertake large-scale rebuilding, certain basic policies must be established nationally and regionally: directives must be given broadly so that the city's officials and its citizens can see in the large their place in the State, the region, the Nation. We must have, first, some picture of the most desirable distribution of the population nationally. What is to be the balance of farm and nonfarm families? Management of our forests generally as a crop for sustained yield will give jobs to additional hundreds of thousands: but American agriculture, by using the best soils and improved practices, can provide all Americans balanced nourishment—and indeed feed some of the rest of the world—with 3,000,000 fewer people than now live on farms. Diversification of farming in parts of the United States now largely devoted to cash crops, and the substitution of hired labor for sharecropping will force many off plantations. Some will move into newer, small urban centers; others will seek larger cities.

Each city will have to ask itself what activities it is best fitted to carry on in a post-war world in which there will be many changed factors. Undoubtedly some activities now carried on in cities could be more economically performed in new and simpler types of communities. Would a comprehensive reorganization of our transportation system minimize a city's former importance as a junction or transfer point? Would it profit a town famous as a center of learning or as a

haven for health seekers to attract manufacturing, if it thereby lose its soul? Is the indiscriminate attraction of industry—any industry—by any means—tax exemption and bonuses—wise? Will it bring stable prosperity to the city? To some of these questions the National Resources Planning Board is addressing itself through its studies of industrial plant location, energy, and transportation. The Federal Power Commission and the National Power Policy Committee are also engaged in basic studies which should help to provide answers.

But the city is not just the result of transportation and power policy. The modern city is a world-wide type of structure to which lines of swift transportation and instantaneous communication are merely connecting strands. The characteristics of each urban area largely determine the appropriate kinds and directions of transport and power. The urban market itself, urban skills, and previous urban industrial development are important factors in determining industrial location.

### The Urban Way of Life

City living has become the life-way of more than half our people. Since cities grow because people move there from the country, there are clearly forces of great attraction. Even the humble citizen shares the pride of civic magnificence, though he may not think from day to day of the civic services that protect the food he eats, the water and milk he drinks, that have practically eliminated controllable diseases such as typhoid and diphtheria in cities and have brought the maternal death-rate below that of the country. He senses the city as the market of ideas and services as well as of goods, whither come the most enterprising, alert, and energetic.

Yet we all know the man who thinks the city a great place to visit, but who wouldn't live there if you gave it to him; and there are many city dwellers in this and other urbanized countries who say that they prefer not to live in the city, particularly the big city. But is it the city to which they really object, or is it the crowded ride to work, the noise, the inadequate play-space, the lack of neighborly contacts? These are valid criticisms of city living, and large-scale rebuilding of cities must meet them, while preserving and enhancing the values of urban life.

Many of the newer countries of the world that faced the coming of the machine without the medieval heritage of a network of villages and towns, display a pattern of farm and metropolis. Sometimes (as in Australia) more than half the people of each State live in one city, the rest scattered in agricultural pursuits; there is no second city. What is the significance of this fact for the future of American cities?

Here we have a series of questions and considerations that we must face as a basis for city rebuilding.

### The Metropolitan Public Interest

Large-scale rebuilding of cities means that the metropolitan complex must be dealt with as a whole. Too often we have experienced the flight to the suburbs by the comparatively wealthy in the search for amenity and superior services, with the loss to the city of tax-paying ability. Too often, also, we have seen great industrial plants built in the corn fields beyond the city limits, dumping upon the central city the burden of serving their employees (both when employed and unemployed). We have the spectacle, too, of villages in the suburban counties vying with each other in legal enactments, each excluding from its borders unattractive but essential services, like hospitals, laundries, abattoirs, which are apparently sluggish to settle into a sump somewhere in the area. These attempts at irresponsible escape, however, have proved vain—as when the wealthy in their suburban retreats find themselves asked to pay for the education of the children of wage earners employed in the central city who have pursued the dream of owning their own home to a new subdivision of low-cost dwellings. There is no permanent escape from the responsibilities of the city. Indeed, recent studies indicate that real property taxes are higher per capita in many suburbs than in their central cities. The problems of the urban area are national problems to be solved in the long run by all the citizens through their local, State, and national Governments, but in no case under the spell of what James Madison called “local prejudice.” It is becoming clear that much of our urban migration is only an illusion of progress. Too often the vigor of the new area is matched by decay in the old.

Large-scale rebuilding of cities means, then, comprehensive metropolitan planning. To this end we have had in the past private undertakings, like the Regional Plan of New York, (which is able to say that because of the public works program of the depression years 40 percent of its proposals were carried out decades faster than it had hoped); or unofficial groups of officials with some support from public funds like the Regional Planning Association of Chicago. Some States have authorized their metropolitan cities to exercise some legal control over the development of lands on their periphery: a few examples may be noted of voluntary collaboration in programming public works by several governments serving one community of citizens.

Better integration of metropolitan planning, indeed of metropolitan government, generally, is thus one of the guiding ideas for comprehensive city rebuilding.

### Neighborhood Planning

Even within the city it is increasingly agreed that our scale of rebuilding must be large to meet the objective of

providing a physical basis for a satisfying community life: we must rebuild, not by the square block, but by the square mile.

If this conception is accepted, we must clearly have an idea to guide us that will give us more than rows of sanitary barracks to replace rows of unsanitary hutches. We shall not be content with a housing project recently completed in one of our great cities which houses nearly 40,000 people in exceedingly cleverly designed apartments, but which provides no room of any sort in which groups of the residents can meet to discuss common problems.

The guiding concept which is gaining wide acceptance as an ideal in city rebuilding is that of the neighborhood: an area freed from the divisive forces of through traffic, with a circulatory system designed for its internal needs, supplied with its own play spaces, schools, health center, places of assemblage for worship and civic discussion, its own retail shops.

The city has always been exciting to those in the strength of new maturity. But cities must be brought down to human scale if they are to become places for good living for young and old. The neighborhood is urged as the natural unit for the child and the older person as well as for those in the prime of life. The neighborhood-in-the-city must be of a size and character that do not dwarf its inhabitants into anonymity, but provide a stage of sufficiently intimate scale so that the citizen can grasp it and play his role with satisfaction.

With the acceptance of the neighborhood concept, we can free ourselves from the identification of “slum clearance” with the provision of “low-cost housing” which crept into the first legislation making Federal financial aid available for housing in 1932. We can propose the tearing down not only of substandard residences, but of decrepit warehouses and dank sweatshops; we can plan to replace them by schools, playgrounds, parking lots, markets, shops, residences, workplaces—all the appropriately placed elements of integrated communities.

By and large, American architects and real estate men have not taken adequately to heart the late Sir Raymond Unwin’s classic warning, “Nothing Gained by Overcrowding.” Government-aided housing schemes of the past decade have shown that large-scale planning makes it possible to use less than one-third of the site for buildings, instead of the two-thirds permitted under our older restrictive building ordinances; yet in some places there has been too great a readiness to boast of low land coverage without raising the eyes above the ground to see how high the structures towered, and how many people were crowded in each acre.

Large-scale planning will permit less crowding without undue dispersal because of a curious fact about many American cities: the substantial proportion of

building lots within the city which are put to no use at all. They are scattered, they do not of themselves furnish sites for significant development; only if we rebuild by the square mile will they be swept into use.

One other principle should serve as a guiding idea in our large-scale rebuilding: we must avoid a pattern of stratification, whether by incomes, occupations, or otherwise, which will produce self-contained colonies either of manual laborers or intellectuals or enterprisers, which will perpetuate areas marked as the exclusive preserve of persons of one language group or national origin. The challenge to our city rebuilders is to provide the opportunity for free mingling of all groups in our democratic society, without forcing a drab uniformity or the loss of those cultural diversities that have enriched our urban, indeed our national, life.

### Coordinated Effort

The last consideration particularly suggests the importance of a coordination of our public and private efforts at city rebuilding. If the economic objective of post-war adjustment is to be achieved, tremendous sums of private capital must be attracted to the task. In order not to seem to compete with private enterprise, we have heretofore limited the provision of public funds or subsidies for housing to accommodations for the lowest-income group. The stimulus which we have sought to give private enterprise through governmentally guaranteed insurance of mortgages has not attracted capital to central large-scale rebuilding of cities; it has rather accelerated the centrifugal trend by promoting new subdivisions on what seemed the comparatively cheap land of the periphery (the private developer not having to count the full cost of the public services which his colony would entail to the municipality). We must rethink our programs of Federal stimulation of home building, both public and private: (1) So that public and private enterprise together will act so as to give us the desired community pattern, and (2) so that, between them, they can provide proper homes for all income levels. To this end we may have to free public housing agencies from the limitations upon the incomes of those whom they may serve. They will then be able to provide homes (subsidized or unsubsidized) for the great number of badly housed American families above the minimum income level, for whom private enterprise still cannot provide shelter at a profit. At the same time, to induce private development in areas in which it is now reluctant to operate, we should consider revising the forms of guarantees now offered, to include perhaps the insurance of a moderate yield on a reasonable investment, rather than of the principal of a mortgage.

If effective city rebuilding is to be achieved, it is of highest importance that proposals for public works be

related to the work that we expect private enterprise to undertake. How can the city engineer be certain that his sewer will be neither too large (and wastefully expensive) or too small (and inadequate), if he does not know the density of residential development proposed for the area? Will the superhighway, while facilitating through traffic, render ineffective a scheme for an integrated neighborhood, much of which would be built by private enterprise? Or, on the other hand, will a publicly aided housing project lie athwart a needed arterial highway?

It is essential that the various governments serving the people of a city recognize their common constituency. Just as highways built with public money and residences built with private funds must compose one finished community, so the objectives of each level of government and of the various departments in each level must be brought together and considered as a composite plan for the area. The information gathered by all the Federal agencies would be of enormous value to the local planning officials if only it were pooled. And once those distinctive local idiosyncracies which local officials best understand are explained to one Federal agency, this information should be provided for all. The more effective coordination of Federal data and programs of concern for community planning is a problem to which the National Resources Planning Board hopes to address itself; it is a problem that must be dealt with in Washington, in the field offices of Federal agencies, and in its impact upon the city.

There will be a place in our post-war efforts for the activities which existing Federal agencies (United States Housing Authority, Federal Housing Administration, Federal Home Loan Bank Board, and others) have been set up to further. Other public agencies will be needed to stimulate or undertake activities in other sectors. We should look forward to bringing these agencies together under one over-all direction, so that their impact upon the cities may be unified and their several undertakings may all lead to a common result. But the paramount need will be the comprehensive vision and the catalytic plan that will crystallize the contributions of these diverse ingredients into a true community.

### New Tools for the Job

It is fair to say that all groups concerned with urban redevelopment have recognized during the last decade the need for new tools—legal, administrative, financial—for city rebuilding. A search must be launched for ways of bringing to bear more effectively the trinity of sovereign powers: eminent domain, taxation, and the police power. Some tools have not yet been fully fashioned but they must be quickly prepared.

How can we accomplish the expeditious and economical large-scale assemblage of land in a country where urban property is characteristically in many small ownerships, and where the half-conscious philosophy of an expanding pioneer century still safeguards the individual owner to the utmost against forfeiture of his land even for failure to meet his obligations to the community? We must look forward to a broader recognition by the public and finally by the courts of the importance for our economic well-being and general welfare of the right of the community to acquire and dispose of land freely, so that the powers of the State may help private as well as public groups in large-scale city rebuilding. We may be encouraged by the readiness of the courts during the last decade to agree with virtual unanimity to the novel proposition that it was a public purpose within the meaning of our constitutions for the government to take land as a site for the provision of individual dwellings.<sup>4</sup> Nor should the power to take land be limited to slums and blighted areas. European cities discovered long ago that to control their own destinies and to realize the patterns that they had set themselves they must on occasion be free to withdraw land on the fringes from disruptive exploitation or to dedicate it to development in accord with a balanced plan. Moreover, it should be possible for the city to retain ownership of land and lease it to private enterprises for redevelopment. In this way there can be flexible readjustment of controls and financial arrangements in the future; if the land is all sold off, we may find ourselves within another generation frozen into the same inflexibilities that now have us in their grip.

There seems to be a basic dilemma in financing urban development: As streets and schools and parks and mass transportation are provided for outlying areas the population leaves the center of the city. Maintenance costs in the center continue nonetheless, and tax-paying ability shrinks. Meanwhile, the costs of the new development absorb all the tax-paying ability that has moved into new districts. The problem becomes more complicated when the population crosses the city line. Modification of city boundaries, shifts to taxes on persons instead of on property, and systems of aids and tax-sharing may all be called for.

We have not realized adequately the power of taxation as a tool for the refashioning of cities, apart from the raising of revenue. Reports of the National Resources Planning Board have already called attention to the role of assessments for benefit, property value increment taxes, and differential taxes which bear more heavily on land than on buildings.<sup>5</sup> Coupled

with other controls they can be of great help in guiding the development of the city into desirable patterns.

Studies in other cities might reveal, like a recent study in New York City, that the city's expense budget was equaled by the expenditures made within the city by other units of government—the Nation, the State, and special authorities. None of these other expenditures was supported by property taxes. If this condition is generally true it demands that the Federal and State governments, if only in the interest of effective use of funds derived from their whole constituencies, should evidence greater interest in efficient and orderly urban development and conservation. It also suggests that indirect ways have been found for tapping the tax-paying ability of those who have fled beyond municipal boundaries, while still earning their livelihood in the central city. These funds should be made available in the slums not only for relief payments, but for more foresighted thorough-going resurrection of these areas. State and Federal Government departments are not organized to provide, alone, unified redevelopment of entire areas. In any redevelopment, municipal government must play an important role, supported by a balanced, diversified tax system in which the Federal and State governments must play their part.

These considerations should lead us to see more clearly that the unit of government best equipped to furnish a service may not always be best equipped to raise the money to support it; we must not cramp our thinking by assuming that a shift in the source of taxes necessarily means transferring the activity. Thus, the State and national interest in equal educational opportunity for all may justify the support of secondary education from sources other than the real property tax, without depriving the local community of control of its schools. Yet the property tax funds thus freed could be used for improved municipal housekeeping and redevelopment. The Treasury Department's current study of intergovernmental fiscal relations should help us understand better some of the financial problems of city rebuilding.

Those who designed the police-power control of city building called zoning 25 years ago adopted the expediency of making its controls negative only—not compelling existing structures and uses to conform to the new pattern, trusting to their ultimate disappearance through obsolescence and decay, and thus avoiding opposition by intrenched interests to a then novel device. A quarter century has shown that the "non-conforming use" tends, under zoning of the old type, to enjoy the privileges of a franchise or monopoly and to persist, nay, to flourish. It is significant that the National Association of Real Estate Boards has for

<sup>4</sup> Or for the clearance of a slum, without regard to the subsequent disposition of the land. The powers of the Alley Dwelling Authority of the District of Columbia under both these heads have been affirmed by the courts, and should be more widely known.

<sup>5</sup> *Urban Planning and Land Policies*, 1939.



some years been recorded in favor of extending zoning so as to force the discontinuance of nonconforming uses (although local groups have not always shown the vision of the national body). Massachusetts has recently passed an act authorizing the City of Boston to move in this direction. The New York City Planning Commission made similar proposals in 1939. Des Moines, Iowa, in 1941, considered a zoning ordinance which provides for the removal of nonconforming uses after a period adequate for their proper amortization. (It is unfortunate that opponents of this forward-looking measure are allowed to dub it "retroactive" zoning—as though it were *ex post facto* and thus implicitly unconstitutional. For once, let the rebuilders of cities prove themselves masters of symbols, and call this "positive" zoning.)

Some States have authorized cities to control the subdivision of land both within and without their borders—to prescribe standards that assure conformity with the pattern of the city. A next step, already authorized by the State of Washington, is to permit the city to prohibit a subdivision altogether if its effect would be economically disruptive.

It is the statesman's task to paint so vivid a picture of large-scale city rebuilding, to propose so compelling an objective that those who have made these and other halting steps in the fashioning of new tools may march together boldly, and that those who have heretofore opposed them can be made to see a gain so great that it overwhelms the basis of their holding back.

### Local Comprehensive Planning

Thirty years of experience have shown us that for large-scale imaginative re-creation of our cities, we need sharper and more powerful tools for local planning. The prevailing pattern of the appointed planning board of unpaid citizens was established in a day when there was less integration of local government; when fewer cities had a functioning executive; and when the only apparent guarantee of immunity from short-run pressures was to insulate the planning group from operating officials. As a result, in most communities, planning boards have not commanded the respect of the local government even to the extent of receiving financial support adequate for a competent staff; and they have often sensed their removal from the scene of action to the point where they have lost interest in their own program. Revitalized local planning must find its place at the right hand of the council and the municipal administrator, proving its helpfulness by providing the data upon which to formulate action and by aiding in the task of coordinating the many activities which together constitute city rebuilding.

Post-war demands to put men and materials to work to rebuild cities cannot find us seeking postponement

because master plans are not ready; on the other hand, it would be tragic to plunge into a series of unplanned public and private works. We must be in a position to bring to bear at the earliest possible data the available facts and the judgments of those who know their communities—officials, civic and social agencies, citizens—to produce at least rough sketches of the directions and forms which community development should take. Then, as time and facilities warrant, we can progressively fill in gaps in our knowledge and refine our plans. The National Resources Planning Board is now arranging with several cities to launch experiments in this type of progressive planning. A community is doubtless best prepared to guide its own future development with exactitude if it has a complete plan based upon a full set of underlying surveys, data, and maps. Nevertheless, up to 1940, only 128 American cities of over 30,000 population had authorized this elaborate and time-consuming process. It is essential that hundreds of other cities take the first steps toward a complete plan. Indeed, it may be necessary to remind even the few cities in possession of a master plan that the proposals there set down are in need of continuous restudy.

The Public Works Reserve, of which the National Resources Planning Board is cosponsor, is conceived as an inventory and program: it requires for its validation a planning base. It affords the opportunity for some significant experimentation, which in simplifying the approach to planning, will still recognize that in some of its phases the planning process is an art requiring skilled judgment.

### Large-Scale Industry

We do not yet know the size of the task and opportunity that confronts us in city rebuilding. In terms of dwellings alone, competent estimates suggest present nonfarm housing needs of well over 4,000,000 units. In the peak year of 1925 fewer than 900,000 dwelling units were produced: to come abreast of our needs by 1950 would call for an average annual production of over 1,100,000 dwelling units.<sup>6</sup>

There will be limits upon the extent and speed of attack set by other factors of the national economy. But the speed with which we desire to act may be checked by internal factors. At the beginning of our defense effort the expression of our national will and the measure of the intensity of our desire was the appropriation of unprecedented sums; it soon appeared that we were not organized to spend the money as readily as we could appropriate it.

If our aim is city rebuilding by the square mile,

<sup>6</sup> Edith Elmer Wood, *Introduction to Housing: Facts and Principles* (United States Housing Authority, 1940), P. 78.



rather than by the square block, the American building industry has never been organized on a scale suitable to this undertaking. Men released from the manufacture of munitions must be retrained for city building in numbers far exceeding those ever before so employed. Provision must be made for their steady employment at reasonable annual wages, possibly in private contracting organizations sufficiently large to afford workers such steady employment, possibly through other devices. Some sections of our building industry are anarchic and disorganized; others present to the Department of Justice the aspect of monopolistic concert. There should be research and experiment to provide us with a modern, efficient, mass-production building industry, instead of the present small-scale handicraft business. Some of the study will be by lawyers and economists, directed to the removal of legal and institutional barriers—obsolete building codes, wasteful disorganization, rackets, and conspiracies. It will seek new legal expressions for the right to occupy land, the right to receive income from land, the right to determine the use of land, better suited to large-scale city rebuilding than the deed, the mortgage, the covenant, handed down to us from Elizabethan times. The ablest architects, engineers, and planners will be enlisted to devise new materials, new arrangements, new patterns for living.

Mass production means standardization, but this word should not frighten us merely because every city dweller knows the frightful standardization of blocks of identical houses built in the old way, with only the street numbers to distinguish one dwelling from another. True standardization would put into the hands of the imaginative designer inexpensive tools with which to create a varied and rewarding living environment. The studies proposed will lead us into many fields. The slogan of prefabrication should not limit our view. A better understanding of the proper orientation of the house to the sun of its latitude may save as much as a new type of heating system.

### **The Training of City Builders**

This research and study should be concerted. It is of sufficient national concern to warrant a Federal agency to support and direct it. It should not be limited to the library and drafting room; there should be experiments under field conditions.

The variety of climate, customs, materials, institutions, traditions, in this great country and the many disciplines involved—architecture, law, engineering, economics, physiology, government, biology, sociology—suggest that some of this study and research be prosecuted at universities in the different regions. The wisdom of this procedure has long been recognized in the study of agricultural problems: a Federal agency

maintains a national research staff, and aids experiments at stations closely connected with agricultural colleges.

Such a pattern of activity will not only further scientific investigation, it will help to train the corps of men to whom we must look to have the breadth of grasp, the understanding of many forces, the ability to synthesize the work of many specialists, and the imagination without which no worthy rebuilding of cities can take place. If we do not take steps soon to begin that training, we are in danger of missing what may be the great opportunity of a generation to provide ourselves and our children with a new pattern for living.

### **A Flexible Program**

As we approach post-war urban development, as we fashion our new tools, we must be sensitive to two types of adjustment which particularly call for flexibility.

We must be prepared to assimilate into our program the effects of wartime decisions which were made with a single view to speeding national defense, to salvage permanent values from them. If new centers of population have grown up around war plants, it is part of the problem of urban conservation to study the conversion of these plants to peacetime products nationally and regionally appropriate, to avoid fresh dislocations if the plants are abandoned.

We must also be ready to meet the impact of a wave of technological change—for war is always a great breeder of invention. The Congress has already recognized the need for airplane landing strips along highways. What will be the effect upon our cities if, instead of bombers, our expanded aviation industry turns to the mass production of flivver planes? What is the significance for the future of the experiments with mobile trailer camps to which the emergency has driven us?

We must grasp opportunities for imaginative redevelopment in ways that have not before been adequately considered. The post-war period may see a comprehensive rebuilding of our national transportation system. Part of such a rebuilding would be the coordination within the city of transfer facilities and terminals of rails, water, air, and highway transport—including the parking lot as a terminal for the private passenger car and the airport as a terminal for freight cargo.

With these changes we may establish a new relation between city and country that can enrich the possibilities of education and recreation. The neighborhood will provide the meeting places, playgrounds and quiet open spaces close at hand, but the great wilderness will be brought within easy reach of the average city dweller.

(Even now a long summer week-end holiday takes 1,500,000 people out of their customary orbit in New York City—including 135,000 to a public ocean beach 40 miles away, and 100,000 to an interstate mountain reservation 50 miles away.) We have made only a beginning in a few cities toward realizing the possibilities of camping for city children, indeed for whole families. Nor should we overlook the recreational and educational value of this freer interchange to the country dweller, to whom the zoological gardens, the museums, theaters, and arenas of the city are rendered accessible.

### Unfreezing Urban Land

To provide a basis for rebuilding cities by the square mile, rather than the square block, we must make urban land fluid again. We must be able to assemble it in large blocks, and to devote it to suitable purposes which will sometimes be different from its present use, or the use of which the owner and the tax assessor now dream. In any case, we must plan its contribution to the community without distorting our pattern because of the pressure of earning a return upon an insupportable land value, or the desire for an unearned increment; and without necessarily asking the occupants of the new structures to meet the full cost of removing the obsolete structure that previously stood upon the site.

This basic planning concept will give proper perspective to the demands for reduction of assessed values or for the taxation of real estate upon income in terms of which the approach to city rebuilding is sometimes put. It will reveal, too, the importance of freeing urban land from the burden of other fixed claims against it which now in effect sterilize it. If we keep replanning before us as the prime consideration, we can view questions of mortgage burdens, municipal tax and debt limits as parts of a larger problem of fiscal and financial policy to be answered in quite different terms.

There is a job of civic sanitation to be done. A century of *laissez faire* has left us with claims against the land which, if they are to be recognized as valid, will keep the land frozen, because they are based upon conceptions of the value of land which no longer seem supportable. Looking back, we must recognize that it was our civic short-sightedness, our lack of group vision, that kept us from instituting effective controls over city development. If we pay these claims, we shall be paying for past errors—the inability to foresee the effects of the advent of the automobile and airplane, the bad judgment exercised by people and institutions in buying or lending money on land, even in some instances for individual greed or corruption.

With the other demands for municipal services and the limitations upon their financial powers, there is little hope that cities can recognize these claims and

buy up the land for rebuilding without aid. If it be proposed that the Federal Government help, the question will be asked, "Should we bail out the owners?" The answer will be in terms of public policy. Who owns the land and the claims against it? Small home owners and investors, great estates or mutual institutions like savings banks and insurance companies? We do not know, and we must find out in order to give an intelligent answer. Is the owner of an obsolete structure to be paid values which should long since have been amortized, when the structure as it stands may violate half a dozen laws? Who should shoulder the burden: citizens as local real estate taxpayers; the same or other citizens as the payers of graduated Federal income taxes; the same or other citizens as policyholders in insurance companies that may have to take losses on their mortgages? These are issues to be debated as public policy, as part of fiscal policy, while we unfreeze the land, or else, to burrow a phrase from Winston Churchill, if we bring up the past to quarrel with the present, we may lose the future. The welfare of more than half the population of the country and indeed the entire national economy are at stake in freeing the land for city rebuilding. Federal intervention is necessary, and its terms and conditions should be propounded.

### A Federal Urban Affairs Agency

The city in its modern form is a world-wide phenomenon. Its implications are everywhere recognized as national in scope. In the United States there must be leadership by the Federal Government in meeting problems of such size and national importance, involving fiscal and tax policy. About 60 Federal agencies offer significant aid to cities either in the provision of money, credit, or information, in the formulation of standards, or the loan of technical aid. For problems affecting farmers we have a central policy planning board in the Department of Agriculture supported by the research arm of the Bureau of Agricultural Economics. Its findings are made available to or are developed in cooperation with a series of State institutions, the Land Grant Colleges, which in turn can put them before county planning committees, through a system of county agents. Through the same channels, the central agency can learn what the farmers think and feel, making the planning process truly democratic.

To focus Federal leadership in city rebuilding we need a comparable Federal urban affairs agency to aid in the formulation of objectives, in the advancement of knowledge and understanding of urban forces, and to help provide unity in the attack of the many Federal units now dealing with the problems of city dwellers. In such an agency might be grouped the leading units actually administering Federal aid to private and public

enterprise in city rebuilding—not only for housing, but for highways, recreation, public works—and in services predominantly for city dwellers. We may learn much to guide us in post-war organization by observing the devices being wrought to focus Federal aid in urban areas particularly hit by the impact of the war effort.

### **Remaking American Cities in Our Generation**

Let us not quail before the magnitude of the task. A Nation that can organize itself for the production of armament as the United States is now organizing, should have no lack of confidence in its ability to carry out any task that it wills. We shall be left after the

war effort with the greatest industrial capacity we have ever had, with more skilled workers, and better mobilized technicians. The rebuilding of American cities is not a task for a year or a decade. As we learned in 1933, it is not an enterprise into which millions of unemployed arms makers and soldiers can be rushed. But if we think through our problems, discuss and determine our policy and approach, prepare our plans, sharpen our tools, and frame our organization, we can seize what may be a unique opportunity to remould our cities, to provide a creative, healthful and satisfying living and working environment for a people afforded economic security by full employment.

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## PART III

### 8. PLANNING FOR SOCIAL SECURITY\*

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#### Long-Range Work and Relief Policies

"Economic security is not to be interpreted narrowly nor regarded as an end in itself but as a condition which enables men to build on the secure basis of an assured standard of material well-being, a fuller, richer, and, above all, a freer life."

This must be the goal of a democratic nation. To an increasing extent we have come to realize that if political equality is to have any significance it must be translated economically into the life of the individual citizen. Public policy dedicated to such an objective must be concerned with the stabilization of employment, the assurance of an opportunity to work, the provision of social insurance for those who are exposed to the certain risks of modern industry—unemployment, industrial accidents, illness, low incomes, old age dependency, and the loss of the breadwinner. Opportunities must exist for education, training, and employment for the youth; protection for the aged; improvement of the standard of living in rural as well as in urban homes; and assurance of work for the able bodied as well as decent provision for the incapacitated. The social services—that large area of general community resources for health, education, recreation, and general welfare—must be made available to an ever widening circle of the citizenship.

Thus, broadly conceived, the objective of social security is concerned with more than the "right to work," or even with more than the prevention of unemployment. Its aim is to secure "freedom from want" and this encompasses a whole complex of measures designed to provide a basic underpinning of the standard of living of the people.

The Committee on Long-Range Work and Relief Policies of the National Resources Planning Board has been studying for nearly 2 years the experience of the past decade of our efforts to provide work, insurance, and relief, and to develop policies and recommendations which might serve as a guide for future planning for these needs.

Government activity designed to provide income to needy or to potentially needy people expanded rapidly between 1930 and 1940. Unemployment and general decline of normal economic activities and sources of private income endangered the security of many millions of our people in urban and rural areas. The

conservation of human resources was sought through a variety of measures, to provide work and training for the unemployed and for youth, aid to rural families, assistance and service to millions of aged and blind persons, to dependent children, and the expansion and improvement in our public health and social services generally. The principle of social insurance was enacted into law, and for the first time in our history benefits for the unemployed and for the aged were made available as a "right." The protection and security of our people became a major activity of government.

These varied programs for social security assumed an unprecedented magnitude during the decade of 1930 to 1940. Plain statistical data indicate the persistence of a serious degree of economic need for large sections of our population. Between 1933 and 1940 the number of households which received some form of publicly provided income varied between 4,500,000 and 7,900,000. These represented from 13,500,000 to over 28,000,000 persons, or from 10 to 22 percent of the total population of the United States. Even after a considerable improvement in economic conditions and in employment, large-scale reliance upon public payments continued. Thus, between January 1937 and June 1940, there were in the United States in any given month never less than 4,234,000 households, comprising some 12,500,000 individuals, receiving income in this way. During the fiscal year 1939-40, a total of 6,768,000 households, representing some 19,431,000 persons, or about 15 percent of the total population of the United States, were receiving some form of publicly provided income. In that year, the total sum of money received by these families from the public treasury exceeded \$3,514,136,000. At one time, in March 1939, about 7,790,000 households, including 23,250,000 persons, representing 18 percent of the entire population, received payments in one form or another.

The dependence of so large a proportion of our population on publicly provided income, and the sharp contrast to earlier years which the last 10 years have presented in this respect, constituted a serious challenge to an individualistic and democratic society. Serious public concern about the "relief problem," as it was often designated, exists to this day. Were these large expenditures necessary? Is the need genuine? Was the general impression that the problem was of an "emergency" and temporary character and would disappear or would be very much reduced with the im-

\*Prepared by William Haber, consultant to the National Resources Planning Board.

provement in economic conditions correct? Or did the persistence of this gigantic problem indicate that our economy of private enterprise and investment could not provide jobs for all? If public provision of income on a substantial scale is not a temporary problem, but is to continue for a long time, are the several measures and methods which we have adopted to administer and finance these activities sound and constructive?

Do these measures, taken together, adequately provide for the needy population? Were preventive and rehabilitative measures fully employed or were we creating a large permanently dependent group? What about the economic and fiscal repercussions which these measures had upon the economy in general: Upon the volume of spending, upon wage levels, upon standards of living? What of the role of the Federal Government? Were the large responsibilities which it has assumed for financing, for administering, or for supervising these manifold activities for social security and public assistance, of a temporary or a continuing character?

These questions—always in the public mind—were pressed with increasing force when the volume of public aid continued very large in spite of considerable improvement in business and employment.

So long as these activities affected relatively small numbers of people for an "emergency" period and involved one-time expenditures, little public attention was paid to the problem and the costs involved. But during the last 10 years these expenditures for work, for relief, and for social security have become an important item in our national economy. The causes of the problem, the methods we employ to deal with it, and the economic repercussions of such expenditures upon the general economy can no longer be disregarded.

The Committee on Long-Range Work and Relief Policies has explored deeply into the economic and social causes of the public-aid problem. Its report, which will be published in 1942, will deal with the specific programs of public aid, the provisions for work, and relief and social insurance. It will be concerned also with the impact of Government activities and expenditures upon the problems of public fiscal policies and the general program of stabilization of employment.

Ten years of experience have produced the design for a permanent framework for social security in the United States. The outlines of that framework are readily discernible: (a) The adoption of social insurance with cash benefits available as a right; unemployment compensation for the involuntarily unemployed; old-age and survivors insurance for the aged, for widows, and dependent children; (b) public-assistance programs for certain categories including aid to the blind, to dependent children, and to the aged; (c) the establishment of the principle of work on public projects for the unemployed and for youth; (d) rapid expansion in the role of

the Federal Government in financing, in administering or in supervising the provision of public aid; (e) the expanding role of State government in relation to the local subdivisions; (f) the increasing importance of the social services, not only for the needy population but for low-income groups in general; (g) the reliance upon the States and the localities for the provision of general public relief.

These developments result from an increasing recognition of the persistent character of the economic and social risks which endanger the livelihood of millions of people and lead to low income or total dependency. They do not represent an even development. In some instances we have gone far toward strengthening the provisions for security. This is particularly true of the measures for the unemployed and for the aged. In other instances, however, we have made progress more haltingly. The absence of public provisions for temporary or permanent disability, either in the form of compensation for wage loss resulting from illness or the use of the insurance principle for medical care, represents a definite unmet need. Likewise, our general relief provisions, aid for the "residual" group not eligible for benefits or assistance under the several specified programs, is available to an uneven degree throughout the country.

During a decade of depression and unemployment the provisions for public aid, taken together, have increased the security of millions of people in all sections of the country. Physical maintenance has been only one of the objectives of these several programs. Increasing recognition has been given to preventive and constructive measures looking to the elimination of the causes of poverty and insecurity. Such measures aim at the speedy absorption of the unemployed into private industry and the maintenance and enhancement of their employability. Public policy has been moving away from the means test. Its rigorous application has been modified on many programs, and it has been entirely discarded in some programs. Social-insurance policy, providing aid as a matter of right, recognized that it is a sound and economical procedure to preserve self-respect and prevent the occurrence of destitution by providing a basic assurance of security in the event of certain contingencies.

### **Social Security in the Post-War Period**

The American economy has been transformed in a short space of time to provide the goods essential for the defense of our country and the other democracies. Under the imperative drive of the war effort, the goal of full employment is rapidly being achieved. Millions of men and women, long discouraged by the fear of joblessness and impoverished by low incomes, are once more productive citizens. The nearly full employment

of our labor force and of our resources has made possible an increase in the national income, with indications that it will exceed 100 billion dollars before the war effort has reached its peak. By that time it is probable that from 40 to 50 percent of our labor force will be engaged in the production of goods vital to the Nation's defense. An increasing proportion of our national income, perhaps as much as 40 to 50 percent, will be devoted to the production of war goods. To an increasing extent civilian needs will be assigned a secondary role. Interstate migration involving millions of workers will transfer labor surpluses from rural towns and agricultural areas into the large urban centers and the newly created "defense areas." The labor force will be increased by the entry into the labor market of "additional workers"; retired persons reentering gainful employment, youth leaving schools, and women leaving home to take advantage of jobs at high wages in war industries.

It is inevitable that these developments and the speed with which they are taking place will create a whole series of adjustments which will have to be made when the emergency is over and the Nation returns once more to peace time activities. Some of the problems are easily discernible. Men demobilized from the Nation's armed forces will need to be guided back into peacetime employment; millions of workers will need to be transferred from war employment to jobs in industries again producing for civilian needs; factories and shops now devoted to the making of essentials of war will have to be converted to the making of the goods which compose the family standard of living in times of peace; migration will be necessary for millions of workers; retraining and transference will be necessary for many others.

These adjustments cannot be made suddenly; many of them will take a long time. Problems of migration and retraining, of conversion and transference require careful planning, and the speed with which the readjustments can be made will depend upon the magnitude of the changes which will need to be faced when the war emergency is over. It is not possible, for example, to determine at this time the full magnitude of the shift from war to civilian production. Will the end of the war result in genuine peace which would make possible nearly complete demobilization? Or will the period be characterized by a truce, requiring a substantial military organization, and calling for the expenditure of substantial sums for defense production for a considerable time. In the first case, both military demobilization and conversion of plants from war to civilian production would be relatively sudden, while under the latter conditions the readjustments of our economy would be more gradual.

Similarly, social security planning for the post-war

period cannot evade the problems presented by the possibility of a serious post-war economic depression. Such a depression is not inevitable. On the contrary, very much can be done by intelligent foresight to avoid it and to control its magnitude if it does take place. Our ability to control uneconomic price advances and an inflationary price level will contribute materially to avoidance of the probability of a post-war depression. Restriction of consumer spending, increase in savings and consumer taxes, increase in production of civilian goods whenever war priorities can permit such expansion, and the creation of large reserves of public works of all kinds, including plans for public housing and similar measures, are some of the things we can do now to ease the readjustments in the post-war period.

Plans may be made also for things to be done later, plans to be put into effect whenever the pressure for war production is reduced. Among these, the public works planning which is now being carried on offers a flexible program for expanding public employment during the transition period and for as long as it may be necessary. It is also important to remember that when the war effort can be relaxed, the Nation will have built up an accumulated backlog of consumer demand for all types of commodities; our workers and consumers generally will have accumulated savings in defense bonds and otherwise with which to satisfy normal needs long restricted or completely denied; our industries will have to replace overused and obsolete industrial equipment; and our housing and construction industry and public services generally, almost completely side-tracked during the war period, will again be resumed. In addition, this country will have a responsibility to contribute toward the reconstruction of an exhausted world. American agriculture and American industry will play an important role in providing the raw materials, food, and manufactured products necessary to revive the once productive economies of the war-shattered countries.

These factors may make it possible to escape serious dislocations in the transition from an all-out war effort to production for civilian needs. There are, however, too many dangers that our best plans may not be sufficient. Recognizing the economic factors which promise to keep our national income at a high level and making plans to keep our people employed are only part of our task. We must be prepared also to recognize that the readjustment period involves the most serious dislocations and that the livelihood of millions of citizens may be jeopardized.

It is none too early, therefore, to inquire whether the measures we have designed to increase the security of our people, measures largely adopted and strengthened during the past 10 years, will stand the strains which inevitably will be put upon them when the post-



war readjustments have to be made. These measures form an integral part of the structure upon which we will have to rely if the post-emergency readjustments are to be made without serious social and economic strain.

We need particularly to inquire:

1. What special provisions should be made for men demobilized from military service; in which way should we secure their "rights" to unemployment insurance; how shall we protect their old-age insurance benefits; in which manner shall we provide for disability compensation for men in the military service and for their survivors?

2. Can we now plan to provide for the needs of the men who serve in the Nation's military and naval forces by revising our well-established old-age and survivor's insurance legislation, or must we follow the pattern of earlier periods and set up separate systems for this purpose?

3. In what manner must we revise our present provisions for the unemployed? Without neglecting plans to keep our labor force fully employed, it is wise to test our provisions for the unemployed in anticipation of a substantial unemployment problem during brief periods. It is difficult, of course, to estimate whether we must prepare for a mass unemployment of 15 million or more or less than that number. Nor is there enough evidence to make possible the prediction as to whether mass unemployment will follow immediately upon the conclusion of the war or will be felt a year or two later, or whether it is likely to be of relatively short or long duration. Our plans must therefore anticipate any eventuality.

As a minimum they must be concerned with the following:

- a. An effective national unemployment service.
- b. Provisions for transference and migration.
- c. Provision for training and occupational adjustment.
- d. An unemployment insurance program capable of meeting the post-war problem.
- e. Public work employment on productive projects at prevailing rates without a means test.
- f. Emergency unemployment relief for those who for one reason or another do not qualify for insurance or work.

4. Our unemployment-insurance program must be appraised in relation to its economic soundness, fiscal capacity, and administrative adequacy for the post-war period. We need to inquire particularly whether it is possible to meet our national employment and un-

employment problem on the basis of State insurance reserves and a State employment service. We need, also, to inquire whether the problems to be presented by interstate migration, which may involve several millions of people, can be met under State legislation except in a makeshift manner. We need further to compare the present provisions for the duration of benefits with the average duration of unemployment.

5. What changes must be made in our old-age and survivors' insurance program? This is now established on a sound basis, and post-war planning should explore the possibility of extending its provisions to include groups now outside its scope.

6. Should post-war planning include consideration for a unified national social insurance system combining the separate provisions for old age and for unemployment and adding provisions for health and disability?

7. Are any changes necessary in our public assistance program under the Social Security Act? The provisions particularly for the aged and for dependent children need to be reviewed in terms of the very great variations which prevail throughout the country.

8. Social-security planning for the post-war period must include consideration of provisions for illness and for permanent and temporary disability, compensation for wage loss resulting from these risks, and the application of the insurance principle for medical care.

9. Should a basic family-security program in the post-war period include provisions for family allowances?

10. The fiscal basis of many of our public-aid and social-insurance programs must be examined not only in respect to their adequacy for the post-war period but also how they may best serve as part of the general fiscal program of the government designed to maintain purchasing power and business stability.

11. The administrative implications of the several programs for social security must also be tested in the light of the types of problems which will be met in the post-war period.

These issues are by no means all-inclusive. They merely suggest the areas for post-war planning in the field of social security. Our experience in the decade of 1930-40 warns us that we cannot permit ourselves to drift into the post-war period without carefully planning for the security of our population either through the provision of employment or through the strengthening of our measures for social protection against the risks of unemployment and loss of income.

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## PART III

### 9. POST-WAR PLANNING FOR CHILDREN AND YOUTH<sup>1</sup>

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Children and youth cannot be kept in storage. They will not stop growing older merely because adults are preoccupied with the immediate aspects of national defense. For any view that looks to the post-war period, children and youth are the most significant among human beings. They are so significant because they are in process of becoming adults and because within limits that process can be guided. The care devoted to bringing young people safely along the paths to maturity will in large part be the measure of the contribution they will make, both as youth and adults, to our Nation's well being.

We as a people cannot afford to cheapen the civilization we are defending by neglecting the quality of the generation for which we hold it in trust. There is no reasonable alternative to doing all in our power to ensure young people the opportunity to grow into the best men and women they are capable of becoming.

#### The Needs of Children and Youth

Young people today get less effective assistance in the process of growing up than previous generations received. The development of a complex society has weakened or eliminated many factors that were previously a beneficial part of youth's environment. Special measures are necessary to replace such factors. Fortunately, more attention can be given youth today. It is now possible to offer services always needed by growing individuals but until recently not within society's knowledge and means. This represents a real social advance and one which should be rapidly consolidated.

Much has become known about the development of human personality and abilities, and everything points to the great importance of childhood, especially its early years. Attention, or lack of attention, at this time will have profound effects that no amount of later experience can wholly alter.

The infant needs special medical services and close parental care to bring it safely through the critical first year of life. Both the infant and the young child need

the affection of emotionally mature parents and the atmosphere of security afforded by a stable household. Growing children need fresh air, sunshine, good food, room for living, opportunity for play, and schooling that will give them the rudiments of social organization and develop their native abilities as rapidly as possible.

As children emerge into adolescence and approach the threshold of adulthood their needs assume a different character. They face the all-important task of choosing a life-work and preparing for it. Leisure interests change. Both boys and girls need opportunity for outdoor sports and pastimes in order that they may develop vigorous bodies. They need new forms of social recreation appropriate to their new interest in each other. Intellectual horizons expand. Interest awakens in other people, other places, other things—in fiction, biography, travel, in cultural activities, in making things with the hands. They need access to well-stocked libraries, to workshops. They need the guidance of sympathetic, informed adults through clubs and young people's organizations. Increasingly they need opportunities to be of service to others.

At about this period boys and girls become eager to make new friends. They look for opportunities to meet one another informally, under suitable circumstances. They begin to think vaguely about marrying and rearing families of their own. They need to be informed of the many important factors that enter into founding a successful home. They need help in working out a functioning personal philosophy of life, an attitude toward themselves, their fellow men and the world in general. They need to be guided, through home, school, and community organizations, into the ways of active, contributing citizenship, so that they may become a positive element in strengthening democracy. Finally, when it is time for them to leave school and eventually to leave home, they need the opportunity to become self-supporting, to establish themselves in the adult world and to make their own, independent contribution to society.

Each of these requisites for adequate growth and development is being creditably met for some few, fortunate groups of young people. The nation is far, however, from assuring all children and youth the services and opportunities of which they stand in need.

#### The Major Problems Involved

The task of making adequate provision for the normal growth and development of children and youth in this

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The major problems affecting children and youth have been intensively studied in recent years by the Advisory Committee on Education, the American Youth Commission of the American Council on Education, the Educational Policies Commission, the Progressive Education Association, and the White House Conference on Children in a Democracy, as well as by other bodies. The findings and conclusions of these organizations are available in published volumes.

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country in the post-war period involves a great number of human beings. Of the 132,000,000 Americans in 1940, those under 25 numbered 57,000,000 and those under 21 nearly 48,000,000. Fewer than enough children are being born each year to keep the population from beginning to decline in two or three decades. This prospective decline is a further reason why the Nation should take the strongest interest in the conservation and full development of all its young citizens.

The major areas of planning for the well-being of the new generation are: Youth employment; health—maternal, child and youth; social services for children and youth; education; and recreation for young people. Each of these areas presents a considerable range of problems.

In recent years the employment of youth has been a most difficult problem because of the conspicuous failure to absorb young people into the occupational world. Fundamentally, however, the issue is not how to prevent young people from being unemployed and a burden on society but how to give them a chance to participate in building up and strengthening America.

In the field of health we face the problem of supplying for particular age groups preventive and remedial services which under ideal conditions would be part of a broad health program designed to benefit the whole population. We must take into account the delay that will inevitably be involved in developing an adequate program for persons of all ages and the urgency of putting a stop to the long-term human wastage resulting from neglect of the physical condition of children and young people.

The social services required in a modern community are far greater than in any known period of history. Among these social services, the insurance of adequate income for family life would influence the welfare of children and youth more, perhaps, than any other single factor. Economic security is dependent upon numerous circumstances, and the strengthening of those aspects of family welfare which most directly and critically affect young people is a complex problem. Social services for children and youth are limited in scope and frequently outmoded in techniques. They need to be modernized and extended to cover adequately the functions that families in general cannot conveniently perform, as well as to care for instances where particular families are unable to discharge accepted obligations toward their younger members.

The major problems in education center about bringing adequate opportunity for appropriate training to all children and youth. Specific problems of major importance include salvaging the hundreds of thousands of young people who leave school so early or so ill trained that they are functionally illiterate; the revision of objectives and methods, particularly in secondary edu-

cation, to make schooling a more effective participation in and preparation for life; securing the general adoption throughout the many local school systems of better modern educational practices; and particularly enlarging and improving the financial basis of school support in many parts of the country.

The recreational opportunities available to young people suffer from lack of understanding of how significantly the use of leisure can contribute to all phases of individual growth and development. There has resulted insufficient emphasis upon leisure activities in school and a marked deficiency in community recreation facilities.

In order that young people may make their maximum contribution to the war effort and to the period after the war, action is now imperative along certain lines. The services and opportunities needed to develop children and youth to the fullest extent must be determined. Plans must be made for the preparation of needed legislation, the training of personnel, the construction of plant and equipment, and the financing of programs. Arrangements must be made to secure the fullest coordination at the local, State, regional, and national levels of all the services that will contribute to the general goal. Only through such inclusive study and long-range planning to meet the problems of children and youth can permanent national strength be assured.

### Youth Employment

One of the most pressing problems in the early post-war period will be that of providing employment for America's youth. As the armed forces are demobilized and as industry makes the transition from war production to production of peace-time goods and services, millions of young people may be forced to seek new employment. The history of modern industrial slumps shows that the younger workers are forced out of employment first and that the proportion of youth among the total unemployed is far greater than their proportion in the total working population. The problem of employment stabilization for youth in the post-war period needs immediate careful planning if we are to avoid serious consequences to our national welfare.

It is not realistic to expect permanently to achieve full employment of youth apart from the full employment of the whole working population. The solution of the chief problem of youth depends upon finding an answer to the general problem of unemployment. In the past, attempts have been made to solve this problem by devising emergency means of putting the unemployed to work through channels outside the normal operation of our economic system. This was defensible and may have to be resorted to again in similar circumstances. But fundamentally the task is to organize

our economy so that it will function adequately, within reasonable limits of stress, without emergency aid.

The capacity to assimilate goods and services is practically limitless. There are innumerable worthwhile tasks to which the energies of the whole working population can be devoted. It should not be necessary to organize such tasks hurriedly, as emergency measures, in an effort to relieve unemployment. Work on them should progress continually, as part of an ordered program of national, regional, local, and personal development. It is better to have workers absorbed through the regular channels of private and public employment than through emergency employment.

Any impairment of the normal operation of our economy works hardships upon children and youth in other ways than the denial of employment. The majority of young people still live in their parents' home. Widespread unemployment renders insecure the basis of their family life and weakens the ability of the home to discharge its important responsibilities for the welfare of its members. Economic depression adds to the burdens of government at all levels while drastically reducing the resources available through taxation. The difficulty of continuing the services normally supplied to young people by government and of discharging residual obligations for the general welfare are thereby greatly increased.

This is not the point at which to discuss means of putting our national economy on a more secure basis. It is, however, of primary importance to state clearly that the welfare of children and youth is contingent upon such a basis being found. When we are able to maintain a high level of economic activity under normal conditions, no social problem will be insoluble. Until then, no fully adequate program for the welfare of young people can be achieved.

Employment stabilization for youth is not a problem unique to the post-defense period. For fully a decade the inadequate absorption of young people into the occupational world has been a major deficiency in society's provision for the well-being of youth. Every year 1,750,000 youth leave school and seek work. Because of economic conditions that prevailed during the past decade, many of them have found themselves unemployed. A backlog of jobless youth accumulated, which during the midyears of the decade amounted to between 4 and 5 million, not counting more than a part of the large numbers of unpaid and unneeded young workers who resided on farms.

Youth unemployment is now being dispelled through war industrial activity that eventually will require all available manpower, although as recently as September 1941, there were still 1,500,000 jobless youth under 25. But the war activity is prompted by highly abnormal circumstances which must eventually cease to exist.

For the past ten years we have needed public work programs to relieve unemployment among young people, as we still do, and it appears highly probable that such programs will be needed in the post-war period.

Employment as a factor in personality development has not received the attention it deserves. No experience is more essential to a young person. There comes a time in the life of every youth when schooling ceases to be his or her main occupation and interest shifts to productive work. For most youth this time will come between the ages of 16 and 21, inclusive. For others it will be delayed until a somewhat later age. The importance of employment to a young person who is approaching or has reached the end of formal schooling lies in the fact that it provides two things for which every youth has a vital need—work and wages.

A young person needs work as an experience around which to build habits that will facilitate his continued employment as an adult. He must acquire the capacity to earn his living in competition with older, experienced workers. To do this he must learn to adjust himself to situations often widely different from those faced at school. He needs to learn to work continuously, with and without supervision, to be punctual, to get on with his fellow workers and his boss, to take orders, to care for tools and equipment, to master the particular skills of his occupation. These habits are formed most readily when there is no conflicting experience of unemployment to be overcome. It is important, therefore, that youth have the kind of employment that affords opportunities to form desirable work habits and also that they move into such employment with as little delay as possible after leaving school.

Wages are essential to the personal development of most youth. They are a universally accepted measure of occupational achievement. They also afford experience in managing an earned income which is a strong aid to acquiring the qualities of judgment and self-control that characterize the mature individual. The many inducements to spend money that confront young people take on a different aspect when the value of the thing bought must be balanced against the effort required to earn the purchase price. Wages are also essential as a basis for marriage and the rearing of a family.

The consequences for youth of inability to secure employment vary with circumstances. Most young people on the labor market still reside in their parents' homes. If unemployment is widespread and no wage earner in the family is able to secure work, the social disintegration of the family is likely to set in as its resources are used up. The young person may then experience a most distressing and demoralizing period of subsistence upon the welfare services of the com-

munity. It is more common, especially at present, for an unemployed youth to be a member of a family in which the major bread-winner, usually the father, is working. In such a case the youth may be spared material want while still suffering an interruption or postponement of an experience essential to maturation.

When a young person remains unemployed for any considerable period before work habits and the qualities of self reliance have become fixed, the results are always unfavorable. They are particularly detrimental for those youth who have never worked. During the midyears of the last decade many youth were unable to secure steady employment for long periods after leaving school. Some went for years before obtaining their first job.

After seeking work unsuccessfully for months, most young people develop a feeling of hopelessness and relax their efforts. They are apt to become listless, despondent, and generally apathetic. They sometimes lose the desire and perhaps the ability to participate in strenuous pastimes, show little interest in making new acquaintances, and may abandon habits of reading even when books are available. Among emotionally unstable individuals mental derangement may eventually result. Intelligent youth, especially those who have gone through extended periods of occupational preparation, may develop deep feelings of resentment toward the circumstances that frustrate them and toward the assumed causes of these circumstances.

The least that can happen to a young person who undergoes a prolonged period of unemployment is a delay in achieving maturity. This is a serious personal loss to him. It is also an impediment to society, which is the weaker for his immaturity and loses the services he might have rendered as a productive worker.

In the post-war period it is likely that the cessation or relaxation of present defense activities will create a need for special measures to prevent a return to widespread unemployment. In this situation, the public responsibility is clear. There must be built up a reserve program of public work adequate to make up any deficiency in industrial and agricultural opportunity. What part shall be assigned youth in such a program?

No doubt the best solution for youth would be, not assignment of a special part, but simply their incorporation into the total labor force at work on a program which is adequate for every one and in every way. Youth would work alongside adults in activities that inspire the energy and devotion of those of all ages. The youth would receive training from the adults, and the adults would be competent to provide it, in an ideal program.

All experience so far indicates, however, that youth will not be adequately provided with employment in the post-war period unless special attention is given to

youth needs. Discrimination against youth in private employment because of seniority and other factors has been of major importance in the past and is not likely to be eliminated in the near future. In public programs of construction that are prosecuted on a contract basis, the same factors apply. In public work conducted on a force account basis to provide work for the unemployed without regard to age, experience has demonstrated forcibly the strength of the motives that impel preference for those who are primary wage earners and on whom families are dependent for support.

In the future, young people should continue to participate as far as possible in all forms of private and public employment. But if the principle is to be accepted and implemented that all young people are to be constructively occupied, regardless of deficiencies that may exist at times in private and other public employment opportunity for younger workers, it will be essential to continue special programs of public work for youth at least up to the age of 21.

The function of the special youth work programs will be to provide for the newcomers who cannot find a place in private industry or in the other public programs, and thus, by eliminating any period of unemployment, make it possible for youth to enter employment directly at the time they shift their major emphasis from education to work. As a part of the provision for young people on the youth work programs, special supervision and training on the job should be given when they first begin to work, and there should be provision in cooperation with the schools for part-time continuation of their education.

The extent of the need for youth work programs will fluctuate with general economic conditions. It is, however, desirable that the administrative framework of a program of youth employment be preserved, even in periods such as we are now approaching when unemployment among physically fit youth 18 years of age or older may be greatly reduced or almost wholly eliminated, in order that the program will be available to meet any emergency in the post-war period.

With full employment in the near future a youth work program can be largely concerned with training and production for defense industries and with work on conservation projects, such as fire protection in forests, which must be maintained even during a period of war. In more normal times the activities particularly appropriate for inexperienced young people will include: Many types of conservation of natural resources; some types of construction projects, such as housing facilities for youth in work camps and buildings for resident centers at schools and colleges; production of food and clothing for the youth themselves or for needy children or adults; education, recreation, and welfare services for children, youth, and adults.



Much of the public work for young people in recent years has been provided on a part-time basis. This may have been necessary under the circumstances, but it is widely believed that a part-time work program is not adequate for most unemployed youth unless supplementary education is provided by some appropriate agency to complete a program in which they may be constructively occupied on a full-time basis.

The related training needed by youth on emergency work programs may best be provided by the schools when it is practicable to bring the youth to the school or the school to the youth. When it is provided by the schools, the primary responsibility for this training should be recognized as lying with the State rather than with the local community. Where local schools have the resources to carry out this function, the State should delegate it to them. The Federal Government should supply funds for the supplementary training provided by the schools for young people on any youth work program the Federal Government may conduct. These funds should be administered through State and local educational authorities.

Much work suitable for young people, particularly forest work, lies in areas where school facilities cannot easily be made available. Under such circumstances and after having exhausted all reasonable possibilities of obtaining the desired assistance from school authorities, it is essential for the agency conducting the work program to develop through its own efforts a supplementary training program.

School authorities should seldom undertake to conduct work programs intended primarily to provide employment for the unemployed. It is entirely proper and highly desirable that they develop programs both of paid and unpaid school or community service for their students. But the emphasis in these programs should be mainly upon the educational aspects of work rather than on production or the relief of unemployment.

Work programs for masses of unemployed adults or youth, and training on the job in connection with these programs, should be recognized as primarily the responsibility of the Federal Government. Only the Federal Government has the resources and the information necessary to meet employment needs with a sufficiently flexible program.

Experience with work programs for youth indicates that there are many aspects that could be improved and many issues that need to be clarified. Among pertinent questions that should be fully examined are: What can be done to make public work programs for out-of-school inexperienced youth more valuable as production, conservation, and service projects? How can they contribute more effectively to improving the health of participants? How can they better promote the train-

ing and development of youth? How can they be made more suitable for girls?

### Health

A major concern in both the war and post-war periods is the health of American children and youth. The most essential requirement of successful living is sound health. The most crucial health period in the whole life span lies in infancy and early childhood. In 1940 more than 180,000 young people died before the age of 20. Three-fourths of them were less than 5 years old. An additional 74,000 infants were stillborn; close to 100,000 more, though surviving, carried with them the handicap of premature birth. Nearly 9,000 mothers lost their lives in childbirth. Their death is a child problem, since it deprives the surviving children of the mother's care that means so much to them.

There is undoubtedly need for a broad program to assure adequate medical care to the whole population. It is equally true that the state of other essential social services, such as housing and recreation, has an important effect upon the health of the people in general and young people in particular. Nevertheless, the health problems of children and youth are so well defined, the ways of meeting them so evident, and the penalties for neglecting them so heavy that the promotion of special measures to safeguard and improve the health and physical fitness of young people should have first claim upon our attention now and in the post-war period.

The health requirements of the infant begin with the need to be born of healthy parents. Wholesome, pleasant surroundings are important, as is also care from adults acquainted with at least the rudiments of modern knowledge of child development. The services of a physician, preferably one with pediatric training, should be available, particularly during the critical first year of life. Mothers need health supervision and instruction both before and after the birth of their children, skilled medical attention during the birth, and in many cases, the use of hospital facilities.

The child who has successfully traversed the dangerous years of infancy is confronted with other health needs whose neglect will have serious consequences. He shares with persons of all ages the necessity for adequate amounts of nourishing food, rest, and sufficient opportunity for vigorous, outdoor exercise. The lack of these essentials is particularly damaging during childhood and youth, for these are periods when the foundation must be laid for a robust constitution that will stand up under the strains of adult life. At least one-third of the children suffer from nutritional deficiencies of some considerable significance.

Physical defects impede the normal development of many children. There are half a million crippled children. Hundreds of thousands more have unrecognized



defects of sight and hearing that handicap them in their schooling. In all, there are approximately 2 million persons under 21 with specific physical handicaps, in addition to the much larger group affected by malnutrition. Not half of even the obviously handicapped are getting the special attention they need.

The growing individual is also especially susceptible to a number of serious diseases. Rheumatic heart trouble is much more prevalent in children than is usually recognized. Dental decay, our most common and costly disease, reaches its peak in adolescence. The venereal diseases begin to exact their toll at about this time and find their highest incidence in early adult life. Respiratory defects multiply during youth and often flare up into tuberculosis in the early 20's. Some types of mental disease characteristically attack young adults, having gained their foothold through predisposing conditions that were allowed to exist in childhood and youth.

The cumulative effect of the numerous health hazards to which young people are exposed has been strikingly revealed during the past year in the rejection for physical defects of 45 percent of young men examined for military service. Some rejections are due to teeth and bone abnormalities which could have been prevented if proper nutrition and adequate dental and medical care had been available; some rejections are caused by diseased or scarred tissue that could have been avoided if young people had been insulated from tuberculosis, syphilis, and pneumonia; most rejections are caused by preventable circumstances. Here, in the selection for the armed forces, we see clearly the extent to which we have failed to surround children and youth with conditions that would build strength and health, vital factors in national defense.

Both the knowledge and the means are available to save the lives of tens of thousands of children and youth annually and to protect their health with reasonable safeguards. The nature and extent of the services required to reduce infant and maternal mortality to a minimum are known, and a substantial beginning has been made in supplying them. Within the past decade the rate of maternal deaths has been reduced by a third and infant deaths by a fifth. Present death rates in these groups can be halved by going forward with the application of measures that have been tested and found effective.

Child-health conference centers are urgently needed in the 2,000 rural counties where no child-health service of this nature now exists. The effectiveness of such services should be increased by making pediatricians available for consultation. Public health nurses are needed in the 1,000 counties where there is no public nursing service for rural mothers and children. Similar

services in urban communities need to be extended and improved, especially in small cities.

The health services of schools should be made much more than routine and perfunctory. The improvements most urgently needed are thorough examinations at least every second or third year, and provision for diagnosis and remedial work when parents cannot procure these services elsewhere for their children. Hospital care and the facilities for out-patient clinics are nowhere adequate for the needs either of young people or of the general population.

On all the Federal youth work programs physical examinations are given, and for youth on resident projects some remedial care and hospitalization are available. Health services on youth work programs should be intensified, with more attention given to the use of resident work camps and centers for purposes of body-building and training in healthful living.

To assure health services for mothers, infants, preschool and school children on an adequate basis throughout the Nation might mean increasing fivefold the modest appropriations which are already being made for these purposes under the Social Security Act. Even so, the necessary action should be taken. The expense would be moderate in relation to the value received. No social service is more important than health.

### **Social Services for Children and Youth**

In addition to medical care, the normal development of the growing individual requires adequate food, shelter, clothing, and the guidance of sympathetic adults. In order that young people may be free to devote their energies to the opportunities and responsibilities proper to their age, society undertakes to provide them with the necessities of life. The medium through which the older generation performs this service is, for most children and youth, the home. Within the family circle the young person obtains the economic and emotional security without which his development would be hampered, perhaps even arrested. It is, therefore, of particular importance that the home be enabled to carry on its functions successfully.

Among the social measures designed to improve the economic basis of family life are: Compensation for industrial injury; unemployment compensation; regulation of minimum wages and maximum hours of work; public work programs for the unemployed; compensation for time lost through illness; the dismissal wage; old-age or retirement pensions; public housing programs; the food-stamp program; and aid to destitute families. All of these devices operate to the advantage of young people insofar as they help to make parents economically able to provide the services which ordinarily may be expected of them. Among other measures benefit-

ting young people more directly are: The child-labor laws; special allowances to families having dependent children; and the provision of special foods, such as milk, or of complete meals to school children, either free or at a reduced price.

Some social services are regulatory in nature and probably will need to be continued under any conceivable circumstances. It is apparent, however, that in a considerable degree measures of social welfare are substitutes for a full-functioning economy in which there is adequately paid employment for all persons who can and should work. To the extent that such an economy is achieved in the post-war period, the burden to be carried by the social services will be lessened. However, it does not appear probable that fluctuations of industrial activity will be wholly eliminated. Even under the most favorable economic circumstances yet experienced there have remained numerous families who needed assistance in order to carry on the normal functions of the home. The question of any major reduction of the social services other than unemployment relief is therefore largely academic, at least for the present. We need to strengthen them, to maintain the channels through which they are administered, to create new channels. It is especially important to increase the social services intended specifically to benefit children and youth.

It is not generally realized how numerous are the young people who live in families so poor that opportunity for normal growth and development is severely restricted. While direct information on this point is incomplete, it is known that, in general, large families are concentrated in low-income groups. Large families are distinctly in the minority, but they contain a high proportion of the children. Nearly half of all white American children are in families that when completed will have had five or more children, and approximately a quarter are in families of seven or more children. This fact alone suggests the magnitude of the problem created by the impact of poverty upon the growing child.

It is likely that some of the social service programs now being conducted for needy families in general should be pointed more particularly toward families with dependent children. The food-stamp plan might be altered to include special provision for families with children. Its purpose would then be to enable every member of the family to obtain a well-balanced diet rather than primarily to dispose of surplus crops. A beginning has already been made in extending the stamp plan to clothing. The clothing-stamp plan should be expanded, and provisions might be incorporated to bring about wider distribution of children's clothing. On public-housing projects, special provi-

sion might well be made<sup>\*</sup> for families with several children.

Home or family security is essential, and it is proper for society to ensure it, but there is much each family can do that is not entirely dependent on this security. No matter how adequate the family may be economically, it does not follow automatically that the family will serve effectively as the center of life for the young person. Parents generally need to take more seriously their obligations to guide each young member of the family. The mature experience of the older members must be shared with the younger. Young and old alike should try to make the family the major center of experience for developing young people. Only as each family spends time, energy, and loving thought on child rearing and youth guidance will society be assured of the health, intelligence, and strength of character basic to welfare in the present and the post-war period.

The Nation needs all its children, those from poor families as much as those whose parents are financially more able to care for them. There are no children to spare. We cannot afford not to make the best of those we have. Direct assistance to needy families with children is one positive step to this end. Encouragement to all families to devote more attention to child care is an equally important need.

To help adults discharge their parental obligations is not the only function of social services for children and youth. Society has undertaken to perform certain parental functions for those children who have no adults upon whom to depend or whose parents have failed conspicuously in their duties toward their children, as well as for those, such as mental defectives, who cannot be cared for adequately in the home. There is need for improvement in both these types of service. In many instances institutionalized care of orphans, abandoned children, and children from broken homes should be supplanted by placing such children in foster homes under adequate supervision.

Appropriate treatment of delinquent children and of youth who have committed some criminal act is a particularly important social obligation. To reduce and eventually to eliminate delinquency and youthful crime, young people must be ensured an environment from which the elements that impel them to violate the law have been removed. Basically, this means adequate and satisfying conditions of living and working. To achieve such conditions will require combined action along many lines over many years. Meanwhile, the relations of young people and the law should be conducted with the greatest insight.

In our juvenile courts we have enunciated the principle that children and youth cannot be in conflict with society. Yet we often inflict upon a young person

charged with violation of the law an experience likely to damage him mentally, emotionally, and morally. In most cases it is quite unsuitable to deal with youth through the legalistic administrative procedures designed for the adult criminal. The usual techniques of arrest, detention, and formal trial are likely to be unwholesome for a young person. Commitment to a penal or correctional institution often has an effect opposite to that sought.

The good work begun in the juvenile courts needs to be carried much further. These institutions, everywhere overworked and too few, should be increased in number and provided with the facilities to do their job adequately. The age limit below which they have jurisdiction is in most cases too low to afford the benefit of their procedure to the majority of youthful offenders. The most common upper age limit in juvenile courts is through 17. In 1940, nearly 3 out of every 4 arrests of youth under 21, of which 130,000 were reported, were of youth 18 years old or over. To the extent that juvenile courts are not wholly adapted to meet the difficulties raised by the somewhat different psychology of youth in their late teens and early twenties, special provision should be made for this type of offender.

The courts need greater latitude and additional professional aid in applying correctional measures to young people. The suspended sentence and parole are useful instruments and should be more widely and intelligently used. Children and youth, however, have a need for more guidance and skilled assistance than are usually available through these means or in our present penal institutions. The correction of youthful offenders is primarily an educational, not a penal matter. It demands the skilled services of psychiatrists, psychologists, social workers, and educators. We need to develop a new type of treatment for young people who come into conflict with the law. They should not be treated like mature criminals. Their rehabilitation should be undertaken and the effort continued until they can be returned to society as useful citizens.

### Education

The education of children and youth should benefit greatly from the opportunities of the post-war period. Education is our largest social undertaking and offers almost unlimited possibilities for putting material resources and human abilities to work in ways that contribute to the national well-being. Over 31 million people, or nearly a fourth of the population, are enrolled in schools and colleges. Our efforts can hardly be applied to a more fruitful or more essential task than to help these individuals along the road to self-improvement and better citizenship.

One of our chief needs in the United States is to

perfect an integrated system of free public education beginning with the nursery school and extending without break through junior college and to the various phases of adult education. Good programs at all levels are now in existence, but viewed as a whole our educational achievements have been markedly uneven.

The importance of supervised educational experience for the preschool child should be fully recognized. The kindergarten and, more recently, the nursery school, have proved their effectiveness as means of offering such experiences. They are still, however, too frequently regarded as nonessentials. Even the kindergarten enrolls no more than half the children who ought to be attending it. In all thickly settled parts of the country, opportunity to attend nursery schools and kindergartens should become as generally available as are the lower grades of elementary school.

In elementary education, the great need is for increased financial support. Although substantially complete coverage has been obtained, much instruction in grades one through eight, particularly in areas where children are most numerous and financial resources most slender, remains very inadequate. It is hampered by the dietary and other health deficiencies of many pupils in these areas, by lack of school equipment, and by poorly trained teachers. These circumstances seriously restrict the opportunities for large numbers of children for early development and later achievement. The operation of the Selective Training and Service Act is revealing how widespread has been the failure to give young people the groundwork of a useful education. Thirty-five thousand young men in one State signed their registration cards with a mark. It is estimated that in some localities nearly half the Negro young men and a quarter of the white young men are excluded from the armed services by their inability to read or write.

At the secondary school level the education of American youth suffers from the same financial handicaps that impede elementary education, and in addition there has been no general agreement either in theory or in practice concerning proper aims and appropriate techniques. It has for some time been apparent that the traditional curriculum of high schools, intended to prepare a selected class of youth for college entrance, is no longer appropriate for a type of institution which already enrolls 75 percent of the youth of high-school age, only one in five of whom will ever go on to college or university. It is equally evident that what the great mass of American youth needs to learn in high school is how to be good citizens who are efficient, successful, and not too discontented in the lives they will lead in their communities after graduation. Although this objective can hardly be disputed, educators have been slow to acknowledge it and reluctant to accept its implications.

Curriculum revision has begun in many forward-looking school systems, but very much still remains to be done.

In large part the failure to match our remarkable quantitative advance in secondary education with a corresponding qualitative gain is attributable to the unwillingness of parents, teachers, educational administrators, and members of boards of education to face the existing situation. There is need for widespread revision of methods, equipment, and personnel if secondary schools are to adapt themselves to the actual needs of youth in the present day. To this extent, the main task of secondary education in the post-war period is clear.

During the past decade the processes of secondary education have been closely scrutinized by several nationally constituted bodies of leading educators as well as by prominent laymen. As a result of their deliberations, a consensus is emerging on what the real functions of the high school are and how they can best be performed. It now becomes the duty of persons responsible for conducting the public schools to acquaint themselves with these findings, to weigh them carefully, to examine their own school systems in the light of them, and resolutely to set about bringing the schools of their communities into line with the best in modern educational theory and practice. The magnitude of this task can no longer serve as an excuse for delay. When objectives become clarified, methods of attaining them will be found. It is within the means of this Nation to provide the kind of education that American youth need. There is no purpose for which its resources could more fittingly be mobilized.

A notably weak point in the system of public education is the abrupt break that comes after the twelfth grade. It will readily be granted that not all youth should seek the professional training offered by colleges and universities. Many, however, would profit from a continuation of formal education beyond high school. The first 2 years of college are usually an extension of general education and fall within the scope of the public-school system. It is not important that this period of study in existing 4-year colleges and universities be absorbed by the public schools, though such a change might enable some institutions of higher education to perform more effectively the functions that particularly pertain to them. What is most important is that opportunity be afforded every young person to carry his general education to a point consistent with individual ability and the general welfare. It is therefore desirable that junior colleges be recognized as an integral part of the free public-school system and that they be widely established throughout the States.

There is also need for technical institutes where high-school graduates who are about to enter the labor

market may prepare themselves for specific lines of work in short, intensive courses. To some extent this function may be performed by the junior college, and by the high school for those who leave school at the earlier ages. Where it is not, additional provision should be made by State or local educational authorities.

The obligation to make instruction in vocational subjects generally available does not end with young people about to enter the occupational world. It extends to persons now employed and to unemployed workers, whether youth or adults. These individuals should be helped to increase their occupational competence, to prepare themselves for a better job, and when necessary to acquire a new means of livelihood. It is also desirable that they should have opportunities to continue and expand their general education, according to their abilities and interests.

Vocational education in its various forms, although highly important, is only a part of the service which schools should provide in connection with occupational adjustment. Processes of general education are neither complete nor well balanced unless they are oriented to preparation for work as much as for other major phases of life. Every pupil should receive from the high-school curriculum some experience with work, both paid and unpaid, as a part of his general education. In courses devoted to the natural sciences, the arts, and the social sciences, aspects of the subject matter which bear upon the future occupational orientation of the pupils should be brought out fully. Guidance through individual pupil counselling should be provided from the seventh grade onward to assist pupils in narrowing the range of their prospective occupational choice and to help them organize their preparation for vocations realistically.

A primary cause of the deficiencies in the opportunity for schooling available to American children and youth is the present basis of support of the public-school system. In most communities the schools still subsist primarily on local taxes. The cost of public education is low in relation to the value received, but the increasing volume of equipment and services required to prepare young people for the complexities of modern life have raised the cost to a point where it is beyond the means of many communities. This is especially true of school districts whose boundaries were drawn in days when a one-room school provided what could be considered an adequate education.

Considerable economy of administration, with consequent increase in the ability to supply needed services from local funds, could be secured through consolidation of school districts. There are more than 120,000 local school districts in this country. For purposes of efficient administration there probably should be no more than from 3 to 5 thousand.

Consolidation, however, will not solve all or even a major part of the problem of educational finance. There are large areas, containing great numbers of children, where the ability to support education, measured by taxable resources, is extremely meager. Within a single State the variation in ability, even between adjacent areas, may in extreme cases be a hundredfold. Education is constitutionally a State responsibility; it is only delegated to local communities. The States have recognized their obligation to equalize the educational opportunity of their citizens by extending financial aid to local school districts. Not every State aids local communities to the extent that its resources would permit. There are instances where State aid would be more effective if distributed according to a more equitable method. These shortcomings in the administration of State educational funds should be remedied.

However, even if every State did all in its power to ensure that the general level of education afforded its children and youth is kept at or above an acceptable minimum, large numbers of young people would still receive substandard schooling. Some States have a greater proportion of children to the supporting adult population than others. Some States have greater taxable wealth per adult than others. Unfortunately, there is little overlapping between these two groups. The Nation's children and the Nation's wealth tend to be concentrated in different areas. The result is that some States have many times the financial ability to support education that other States possess. In more than a dozen States the expenditure per pupil over many years has been below the amount necessary to provide a minimum acceptable education. In other States, the expenditure is more than twice that amount. In general, the States with the lowest level of expenditure have been making the greatest effort, in terms of the proportion of their revenues that they devote to education. Certain States have resources so limited that they could not provide an acceptable program of education for their children and youth even if they allotted all of their available tax receipts to this purpose.

Recognition is growing that only the Federal Government can remove the substandard conditions surrounding the education of many of our young people. It hardly need be pointed out that the education of children and youth is a matter not only of local and State but of national concern. The Federal Government has long subsidized education in the States, both general education, as in its grants of land for educational purposes, and education of specific types, as in its annual grants of money for vocational education. Decisive Federal action has become essential to remove other educational handicaps from American children and youth. It should take the form of annual grants to

the States for purposes of general elementary and secondary education. It is important that these grants should not disturb the control of the States over their own educational policies. Experience with other Federal grants indicates that no essential impairment to State authority need result from this relationship. Federal aid to general education is urgently required.

In many instances a child or youth fails to receive the benefit of available educational facilities because of the inadequate resources of his family. Financial difficulties usually appear to be the chief reason for the failure to continue in school to the point justified by the young person's abilities. It can be expected that this impediment will be substantially removed by the general improvement of economic circumstances which must be the foundation of any lasting program for the welfare of young people. Yet while it exists, the difficulty is so serious for the individuals concerned that special measures are justified to ease it. Until every parent is able to maintain his children in school as long as may be best for them and for society, we need a flexible program of student aid at and above the secondary level that will enable the young person or his parents to meet the expenses necessarily incident to continuing his education.

Public libraries constitute an important adjunct to our system of free public education. They are accessible, however, to no more than two-thirds of the population. Of this portion, only half lives in areas where reasonably satisfactory library service is available. Nearly 40 million people in rural areas, including a disproportionately large number of children and youth, are without library service.

The improvement and extension of public library facilities should be a concern of all levels of government. In many instances local communities can and should begin or increase their appropriations. States do not render financial assistance to libraries in a manner comparable to that which they extend to schools, but they might well do so. New methods of organization and new forms of service have proved their worth in recent years and should be extended. These include the county library, the bookmobile and other forms of the traveling library, the multiplication of branch libraries, special departments for children and young people, and mail-order library service.

If libraries are to make their maximum contribution to the education of the people, it seems clear that, like the schools, they will require some measure of Federal assistance. As a beginning the Federal Government might well interest itself in making books generally available to people in rural areas. A modest annual subsidy for this purpose would go far toward meeting a difficult and urgent need.



## Recreation

An important part of the well-being of young people is concerned with the use they make of leisure. Their physical development, the acquisition of skill in social relations, the broadening of their intellectual horizons, and their degree of concern for the general welfare depend in no small measure upon what they do when they are free to follow their own interests.

The opportunities young people have for the constructive and satisfying use of leisure are determined largely by the means available to all members of the community. Commercial facilities are widely distributed. Some afford worth-while opportunities; a few are harmful; many simply consume time and money. Non-profit-seeking forms of recreation, both under public and under private auspices, are a substantial part of the facilities for occupying leisure in many communities. They tend to be provided in increasing quantity.

It is important that the needs of young people be kept well to the front in all considerations of general recreational development, but they can seldom be the controlling factor. There are, however, certain areas in which post-war planning for use of leisure can concentrate upon the requirements of children and youth. These center about the school, public recreational facilities particularly for young people, and the various private agencies working for the welfare of children and youth.

The schools have a major interest in recreation. Education and recreation share the same general aims, and in their more progressive forms their techniques bear a marked resemblance. In nursery school and kindergarten, training is conducted almost wholly through appeal to voluntary interests. In the upper grades leisure activities have tended to become departmentalized and segregated from more formal education, but they remain of considerable educational importance.

Schools contribute greatly to the recreational life of young people. They teach subjects likely to stimulate permanent leisure interests, such as industrial arts, fine arts, and the appreciation of drama and literature. They encourage nonclassroom activities, not only athletics but the numerous special interest groups dealing with arts, crafts, and other hobbies. They sometimes make their facilities available for community recreational use.

The extent to which leisure activities are developed under school auspices varies greatly. Large numbers of children and youth attend schools where inadequate facilities and an overworked staff result in little attention being given to the numerous beneficial activities that can be made to grow out of the regular school program. The mere presence of a vigorous program of leisure activities is, however, no guarantee that school

resources are being adequately exploited. Students who volunteer for athletics, hobby clubs, craft groups, theatrical performances, social gatherings, and particularly the students who are elevated to positions of leadership in these activities, are generally those who have the least need for encouragement along these lines. Means should be found to enlist the participation of the children and youth who would benefit most from the stimulus such activities provide. The schools should also recognize that boys and girls have an urgent need for guidance in the use of the three media that bulk so large in their leisure, the motion picture, the radio, and contemporary reading matter.

An immediate and substantial recreational gain for children and youth in school, as well as for many out of school, could be effected if the educational authorities would keep their playgrounds open after school hours, on week ends, and especially during the summer months. Opportunities for adequately supervised play are too few in cities, and summer is the time when the outdoors beckons most insistently. Unfortunately, just at this period the agency that more than any other occupies the time of the children and youth during the rest of the year leaves them to their own devices.

Camping is another activity that could profitably be developed by the schools. Its high educational values have been well recognized for years. Indeed, it is remarkable that so little progress has been made in promoting school camps. The cost of camping is a serious obstacle, but the cost of the heaviest item, the initial construction, could often be met in part through emergency labor. Food costs can be lowered by the use of surplus commodities. Much of the work of building, maintaining, and operating a camp can be done appropriately and competently by older students, as part of a school work program.

While summer is the most popular time for camping, there is no inherent reason why the period could not be extended in most parts of the country. Week-end camping during the school term is easily possible, and it should not be difficult to arrange the school program so that particular groups of students could attend camp for extended periods at other times than in the summer. Here is a large field of expansion to be undertaken in the post-war period.

The primary goal in the future development of school recreation should be to complete the breaking down of the barrier separating classroom and extra-classroom activities. The schools should recognize that young people have an acute and continuing need to organize their leisure time so that it contributes effectively to their total well being. A school program of leisure activities ought to embrace physical, social, creative, and cultural interests. It should provide instruction, guidance, and practice in the intelligent



use of leisure. Interests which will carry over into adult life should be emphasized. A serious effort should be made to promote family recreation, in order that, to some extent at least, the home may be restored to the central position it once held in the recreational life of young people. Particular attention should be given disadvantaged groups of youth whose leisure pursuits are often characterized by exceptional inadequacy. These would include the older adolescent, rural youth, youth of low-income families, and youth in Negro and other minority racial groups.

To a limited extent, many schools open their auditoriums and classrooms, sometimes their gymnasiums and playgrounds, for general community use outside of school hours. This practice, however, is often restricted by the difficulties of providing custodial care, the expense of heat and light, and the cost of repairing damaged property. Many organizations that could make worthy use of school facilities have very limited resources and are unable to arrange terms satisfactory to the local educational authorities.

A larger conception by school administrators and boards of education of their function in the community should be acquired. The schools have an obligation toward the 50 percent of youth who drop out before graduation from high school. They can meet it best through encouraging all varieties of informal education. Recreational activities are one of the most effective kinds of informal education. It would be appropriate for schools not only to meet the small additional expense of keeping their facilities open beyond the normal school hours but also to provide leadership for community groups wishing to use them.

The schools have a responsibility for making their services available to the whole community. In some places this responsibility has been so fully accepted by the public schools that they have become the sole public recreation authority. It is not necessary or, indeed, advisable that schools everywhere develop into the major public recreational agency in their communities, but they should stand ready, particularly in rural areas and small towns, to assume this role when the necessary leadership is not supplied from other sources. Schools everywhere should become active community centers. New school buildings should be designed with this purpose in view. It ought to be accepted as axiomatic that the community that gets the most from its schools is the community that uses them the greatest number of hours each day and serves the greatest portion of its constituency.

The relations of the schools to the other recreational agencies of the community should be close and cordial. Full acceptance by the schools of the responsibility for developing the maximum recreational use of their own buildings and equipment will make it unnecessary for

other public agencies to undertake part of the task. For schools to assist freely in a public recreation program is desirable not only in the working out of administrative details, but, if possible, in the financing of activities.

Schools ought to display an energetic helpfulness toward private recreation agencies operating non-profit-seeking programs. There should be no zealous guarding of school facilities for school purposes only. They should be made readily and willingly available for every legitimate use. Schools must realize that many other agencies are working for the welfare of young people and the community at large, and that the general purposes for which the schools exist may be served by aiding these agencies to function effectively.

In many cities and some smaller communities the leisure resources available to children and youth through the schools are supplemented to an important degree by the facilities maintained by municipal departments of recreation. Of greatest concern to young people are play areas of various sizes and uses and indoor recreation centers. The need for facilities of these kinds has been carefully studied, and accepted standards exist by which their adequacy can be measured.

An urban community that makes suitable provision for the leisure activity of its children will have a small neighborhood play lot in every block of its thickly populated residential areas. It will provide supervised playgrounds of from 3 to 7 acres equipped with various types of apparatus, one to each thousand persons. There will be playfields of from 10 to 20 acres within a mile of every home, where special tracts may be laid off for baseball, football, running, bowling, tennis, and other sports requiring considerable space. Each residential area should contain an indoor recreational center equipped with gymnasium, swimming pool, club rooms, and work shops for pursuing hobbies and other special interests.

In most cities little more than a beginning has been made toward meeting these standards. The need for children's playgrounds is especially acute. The 94 cities of 100,000 or more population spent in 1938 an average of only \$1.72 per capita for all the services that municipal departments of recreation provide, plus the upkeep of parks, museums, and other special features. The suggested minimum standard for these services is \$3.00 per capita. Nearly half the cities of from 10 to 50 thousand inhabitants have no public recreational authority at all, and among communities of from 5 to 10 thousand the proportion is less than 1 in 4.

The achievements of many public-spirited towns and counties have demonstrated that small size or low density of population need not be a barrier to the development of adequate leisure opportunities for children, youth, and, indeed, the whole population. Every com-

munity has numerous untapped resources that can be drawn together and welded into a full, functioning program. Initiative and intelligent leadership, the elements most needed, are likely to be found locally when the need is realized.

A large part of the recreational opportunities available to young people is supplied by private community agencies. Organizations such as the Boy Scouts, the Girl Scouts, the Campfire Girls, the Y. M. C. A. and Y. W. C. A., and the Boys Clubs of America have acquired the status of national institutions. Churches, fraternal orders, labor groups, settlement houses, and civic organizations assist youth in many ways to employ their leisure profitably. Some of these have separate junior departments in their membership; others, though not enrolling young people, frequently interest themselves in some special project of recreational value to children and youth.

There is a variety of organizations for rural youth, some having a separate existence, other being adjuncts of adult organizations. Two of the largest are the 4-H Clubs and the Future Farmers of America. Though they are sponsored by branches of the Federal Government, the Department of Agriculture and the United States Office of Education, respectively, they may be considered to be private community agencies in that their support and a large part of their direction comes from the local communities in which they are formed.

In post-war planning for children and youth an important place should be reserved for private agencies working in the recreation field. Although they do not have the universal coverage possessed by the public schools, they perform functions in some respects unique and are likely to remain indispensable. Public and private recreational agencies are not opposed to each other in any essential respect. Historically, they have supplemented one another. Both are needed and both must be supported.

A major goal of the private recreational agencies should be to reach more of the older youth. Techniques successful in late childhood and early adolescence seem to lose much of their appeal at about the age of 16. Relatively few of the youth-serving organizations are able to carry a high proportion of their effective membership beyond this age. Studies have indicated that between 16 and 24 not more than one youth in five or six belongs to any organized group outside the school or church.

The private organizations should strive vigorously to reach young people in the lower-income groups. This is already the avowed aim of some organizations, such as the Boys' Clubs, the Salvation Army, and the settlements, but they would be the first to admit that their combined efforts are inadequate for the task. Most

youth organizations have been notably unsuccessful in extending their services to the great numbers of young people in the underprivileged classes. It is essential that adequate recreational opportunities be brought to underprivileged children and youth.

Another major goal toward which private agencies should work is to make their services available to young people in rural areas. The organizations particularly for rural youth have done much to meet this need, but few if any of the other youth-serving agencies have gone beyond the predominantly urban character of their programs.

Finally, the youth work of many voluntary agencies has suffered from too detailed management by adults. Young people acquire a sense of responsibility and the development of character when they assist in planning their own group activities. Adolescent youth wish to manage their own affairs. This is convincingly demonstrated by the multiplication of "cellar clubs," where young people provide their own, unsupervised entertainment. Unnecessary intrusion of adult leadership is probably responsible for a large part of the decline of membership in most youth organizations after the age of 16.

During the past decade private recreational agencies have manifested several encouraging tendencies. There has been a gradual weakening of institutional lines, a greater capacity for self-criticism, and an increased willingness to work together for the common good of the children and youth they serve. More attention is being given to working with young people in groups and to bringing out the social values that can be derived from participation in a common enterprise under skilled guidance. It may be expected that in the post-war period private organizations will continue to be of substantial assistance to children and youth by helping them to employ their leisure in suitable ways.

### Suggestions for Planning

Parents have the major responsibility for the planning that is necessary for children and youth. Society must at all times encourage parents to fulfill their obligations. From birth or before to the day when youth leave home for full adult responsibilities of their own, the efforts of parents must be supplemented at many points by services, disciplines, and opportunities that are socially provided. Social planning for children and youth must look to the future for all that should be done to assist and supplement the efforts of parents.

If social and economic planning may be said to have a pattern, it may be summed up as follows: (1) The determination of goals; (2) the inventory of conditions; (3) the discovery of needs as the inventory is compared with the goals; (4) the projection of alternative solutions; (5) policy making, or the choice of the most fea-

sible alternatives; (6) the absorption and execution of the plan by the community, State, or Nation.

In this country responsibility for social planning for children and youth is not unified in any single agency or at any one level of government. For certain services, agencies of the local community assume the planning responsibility while for others, agencies on the State or national level bear the major responsibility. For some types of services, private groups take the leadership; for others, that function is assumed by government.

#### Local Planning

Post-war planning responsibility for children and youth at the local level needs to be studied and redesigned. The private and public agencies dealing with the services for young people must cooperate in order that the best possible program may be planned and put into effect. Agencies with the greatest stake in the composite program include among others the home, the school, public and private health groups, public and private recreational groups, the social welfare or group work agencies, private employers, youth-work agencies, labor groups, and voluntary youth groups.

Many excellent programs have been planned and operated by each of the separate types of agencies. Unfortunately, agency programs are often only partially effective because of faulty assumptions about aspects of the program outside the special competency of the agency involved. Again, such programs sometimes duplicate in large measure the efforts of other agencies, which results in rivalry operating where there should be cooperation, and important aspects of the total program are either lacking or not properly balanced. The outcome is decidedly haphazard and inadequate. Planning of an over-all and long-term nature must be done now and later if the necessary services and opportunities for young Americans are to be provided in the post-war period.

Many communities are at present experimenting with councils of social service agencies, community youth councils, group work councils, or volunteer offices in the Civilian Defense Program. Such organizations display many diverse patterns of cooperation, but all have in common the purpose of facilitating cooperation among local service agencies. Planning for children and youth appears to be most effective when established as a part of a larger program which includes planning for all age groups in the entire community. Fortunately, most coordinating councils are now concerned with the entire age range of the population, although often they fail to give adequate consideration to the needs of young people.

Typically, these councils are voluntary and remain outside the central governmental and economic activi-

ties of the community. Often they are not associated with the labor employing agencies nor do they participate in the permanent municipal or county planning activities. In such instances, the programs of voluntary action of these councils may fail to be firmly rooted in the primary affairs of the community, with the result that they lack impetus, permanency, and, above all, foresight.

The action programs of the agencies represented in coordinating councils or planning boards must be tied closely into the long-term and over-all planning of such councils and boards. This close relationship is essential throughout but becomes most important when voluntary councils of youth agencies attempt to design work projects of social value to the community. Youth work, both paid and unpaid, should be part of a larger community plan for permanent improvement.

Through proper integration, the action program of each youth agency may contribute in two major respects: (a) It may provide increased facilities for programs in health, recreation, education, and other fields benefiting the entire population of the community over long periods of time; and (b) it may aid the development and the morale of the youth who participate through showing them that they are helping to set the community goals and definitely working toward the accomplishment of these goals. Few things can be more beneficial to young people than the knowledge that public opinion is aware of and appreciates the contribution they make to the building up of the community.

Children and youth are best served when all forces, public and private, cooperate both in planning and action. No one group will then consider the well being of young people exclusively its own responsibility. The home, the school, the church, the agencies for health and recreation, the public and private employer, and labor, all must voluntarily pool ideas and energy if young Americans are to have the opportunities essential for their full development. A council of representatives of agencies serving children and youth provides the machinery through which community planning can be closely linked with action and youth may be enabled to participate in both planning and action.

In those communities where both an active government planning board and an active voluntary coordinating council exist, the groundwork is already laid. The problem there is to get clearer definition of responsibility and more closely related planning and action. Where neither planning nor coordinated action is systematically provided, the task is more difficult.

In many communities the local volunteer office of the Civilian Defense Program may serve as the beginning of a coordinating council or a planning board. In some communities the school may take the initiative in bringing together all major groups to consider the need

for planning and coordination of action. In other communities the leadership may be taken by the mayor, the city manager, private citizens, or by any group that sees the benefit that may accrue to the community through such endeavor. Assistance in starting local planning and coordinated action programs can be secured in many cases from the state planning board or the state conference of social work.

#### State Planning

Planning is likewise in need of coordination at the State level. While it is an established principle of American life that the local community should have great autonomy in determining its own affairs, there is need in most services for a universal minimum standard to be attained by all communities. For example, education is a State responsibility, and the State determines the minimum school year and the minimum training for teacher certification that must be followed by its local communities. Similarly, many local community agencies have parts of their programs set by State agencies.

What has been said of the need for coordination of efforts to serve children and youth on the local level may be said in principle of the State level. State public education, State child and youth welfare, State employment services, State recreation and health agencies, and other public or private agencies should come together in a State coordinating council and work out a comprehensive State program of services for children and youth. This council should find in the State planning board great assistance in rooting the program of the council in sound, long-term trends and plans for the development of the State. Taking their cue from the State's plan for its improvement, the action agencies, public and voluntary, can arrange for youth to work on projects that promote the general welfare.

#### Regional Planning

At the regional level little has been done to plan for children and youth. A few regions, notably the Pacific Northwest, have developed the concept and the essential machinery for studying their educational and recreational needs and planning for regional improvement. To a limited degree regional planning is now under way. In the further development of planning activities at this level, services for children and youth in the post-war period should be emphasized.

One means whereby regional planning for children and youth might be encouraged would be the calling of a conference of agencies serving young people throughout the region. Such a conference should include representatives from the State departments of public education; from private education; from educa-

tion associations, State parent-teacher organizations, and colleges and universities. Youth work agencies, State departments of health, and State medical associations should be able to contribute. Agricultural interests, labor interests, social security agencies, and the public and private organizations concerned with recreational opportunity should also be represented, both at the State and the regional level. State conferences of social work, employers, and other major groups dealing with children and youth should be included.

At such a conference, the most pressing problems concerning young people of the region should be considered. In the Southeast, for example, much attention might be given to ways and means of improving the nutrition and other requisites of health. The problem of the migration of young people to other regions when they reach maturity would demand attention. The conference could arrange for the research necessary to formulate long-range plans, and interim committees could be appointed to carry on the preliminary studies. At subsequent conferences the group could choose among the alternative plans, and the various agencies could accept responsibility for carrying out particular features. Such conferences would do much to stimulate the State agencies and voluntary groups to clarify goals and work together to accomplish them.

#### National Planning

On the national level responsibility for the planning and administration of programs for children and youth is widely distributed. At least 320 national agencies outside the Federal Government are doing important work to improve services and opportunities for young people. Many of these voluntary groups are closely articulated with some Federal agency responsible for a particular service.

Within the Federal Government there are over 25 bureaus or agencies with broad programs affecting young people, and more than 30 others are concerned with some aspects of the problem. A number of agencies operating at the bureau level and others operating at the departmental level have organized planning committees which have as one of their functions the planning of programs for children and youth in the post-war period. Such committees should be encouraged and given adequate support. There is need for planning in all Federal agencies and in all private agencies of national scope dealing with the problems that affect the welfare of young people.

The National Resources Planning Board is concerned with stimulating post-war planning in all divisions of the Executive Branch of the Federal Government, as well as in private agencies of national scope. It is prepared to render such assistance as is possible in this connection. The Board will undertake to bring to-

gether the plans made by these agencies and will assist in developing over-all plans.

### The Contribution of Youth

Youth should serve as well as be served. As we have seen, children and youth need many provisions to enable them to grow normally. Even if all were provided in abundance something still would be lacking—the opportunity to be of service. Each normal child and youth wants to be useful to others. Often this urge is starved for lack of opportunity or lack of guidance during early life. If neglected, it may eventually lapse into impotency. But if it is fed it can emerge as one of the greatest blessings to human society, as well as one of the greatest of all personal satisfactions.

There is another reason why young people must serve. The unprecedented magnitude of the work to be done in the reconstruction of this country and the world in the post-war period will demand all the constructive energies of our entire population—every man, woman, and youth. The health of the Nation must be conserved and improved. Medical care calls for new clinics and hospitals and additional doctors, dentists, and nurses. Health education must be so applied that people will practice at least the elemental rules of sanitation. Protective and body-building foods should be produced in greater quantity. Millions of American families should be rehoused to insure health and wholesome family life. Millions of homes need utilities. Cities and rural areas should be redesigned and rebuilt in order that human beings may enjoy more fully the great advances in science and technology. Recreational areas conveniently located should be built and supervised. Safety factors should be increased, particularly in urban areas and in homes.

Conservation districts must be widely organized to save the basic resources that support our existence. Soil must be restored: erosion checked. Water must be conserved and put to the most useful purposes. Forests must be protected against fire, neglect, and wasteful lumbering. New forests must be planted. Wildlife must be restored to field and forest, lake and stream.

All this work and more represents the challenge of the future. And with all this post-war program of material up-building must go a creative effort to improve our institutions at home and to design the international machinery for world peace and security. Material and institutional improvements are inseparable. All these tasks add up to a great program of work that America will surely want to undertake during the next generation. In this task young people should be admitted as junior partners. This is not special pleading for particular individuals or for a particular age group. It is special pleading for the future of the Nation.

Each child and youth should be challenged to increase the skill and efficiency with which he carries out his ordinary, everyday tasks in the home, the school, and in his own organizations. When young people attain sufficient maturity to participate in socially useful work on a larger scale, their contribution can be especially significant. There are 29,500,000 children and youth enrolled full time in school and college and close to 12,000,000 young people under 25 who are out of school and who either work or desire to do so. Youth whose major interest has shifted from education to work need to be employed on a full-time basis. Those who are not absorbed through the regular channels of private and public employment should be employed in socially useful enterprises of the kinds outlined above. Children and youth in school should be given an appropriate share of the task as work experience, an integral part of their education. Such widespread association of young people with the Nation's business would produce gratifying results to participants and contribute to the general welfare.

It will not be easy to discover ways of utilizing fully the potential energies of youth in the work that needs to be done in the post-war period. It is clear that the social loss of denying them a responsible role in strengthening our civilization is greater than the cost of providing the opportunity to participate. A major test of any culture is the extent to which it continues to offer its young people the challenge and adventure embodied in the age-old desire to build a better world.

### Summary of Recommendations

#### Youth Employment

*Goals.*—To provide a job and a wage for every unemployed youth who has completed his schooling. Particularly, the abolition of any lengthy period of unemployment in the transition from school to work. Opportunity for youth to make their maximum contribution to the building up of America.

*Measures.*—Provide for all youth from about 16 to 21, not absorbed in private or other public employment, a Federal work program administratively separate from a work program for adults.

Explore further the types of public work best suited to young persons: Conservation projects; housing for youth in work camps, resident centers, school and colleges; production of food and clothing for youth themselves or for needy children or adults; services of education, recreation and welfare.

Develop an adequate training program for youth employed on work projects, a program financed by the Federal Government and administered as far as possible by the established educational authorities.



### Health for Children and Youth

*Goals.*—To cut maternal deaths and infant mortality in half. To secure for the growing child the conditions essential for optimum development. To safeguard youth from the health hazards of adolescence.

*Measures.*—Establish maternal-care clinics so widely that every pregnancy that cannot or will not be brought under the care of a family physician shall receive the benefit of medical supervision except in the small proportion of cases where this is not practicable because of geographic remoteness.

Establish child-health conference centers in the 2,000 rural counties where no child-health service of this nature now exists. Make pediatricians available for consultation in these centers. Provide public health nurses in the 1,000 counties where there is no public nursing service for rural mothers and children.

Make the public generally aware of the nature of minimum standards of child care and the importance of the family's doing all it can to meet these standards.

Persuade school authorities of the importance of giving thorough physical examinations at least every 2 or 3 years, in high school as well as grade school, and of following up to ensure the correction of defects. Teach health education realistically and provide for all children and youth opportunity for physical development as an integral part of the school program. Where necessary, supplement local funds with State and Federal aid to enable the schools to render these services.

Inaugurate a Nation-wide public-health program operating in every local community and having the object of ensuring adequate medical care to the whole population. Place particular emphasis upon preventive medicine and upon services for the large section of the population that is self-supporting in all respects except the ability individually to purchase adequate medical attention.

### Social Services for Children and Youth

*Goals.*—To ensure in adequate measure to all children and youth the advantages provided by a good home.

*Measures.*—Strengthen the ability of the family to perform its normal functions toward young people by adopting all practicable measures to stabilize and increase family income. Where necessary, take special measures to enable the family to provide adequate food, housing, and clothing for children.

Give greater attention to society's role of a parent toward children and youth for whom no adult accepts this responsibility.

Develop and utilize techniques of dealing suitably with young people who have come into conflict with society. These young people represent failure on the part of the family and society. They should be restored to a useful place in the community.

### Education

*Goals.*—To provide for every child and youth education and training of the kinds best adapted to his abilities and in the amount calculated to develop his maximum usefulness to himself, his community, and society.

*Measures.*—Supply the additional facilities needed to bring educational opportunity within reach of substantially all young people. Place emphasis where the need is greatest, i. e., the provision in rural areas (particularly for Negroes) of improved elementary schools, more and better high schools, additional library services; and junior colleges and technical institutes in nearly all parts of the country. Replace many existing school buildings with structures better adapted to modern uses.

Carry forward present trends in curricula revision to bring education more closely into line with the actual needs of young people. Emphasize teacher education and dissemination of knowledge of the best modern practices among boards of education, school administrators, and parents.

Institute a flexible program of student aid at and above the secondary level that will make it unnecessary for any youth to drop out of school for financial reasons.

Speed up the consolidation of school districts; revise the distribution of State aid to local school districts; and enact Federal aid to the States for general elementary and secondary education.

### Recreation for Children and Youth

*Goals.*—To ensure every child and youth adequate opportunities for leisure pursuits that contribute to physical, social, intellectual, and cultural development; where necessary, to supply guidance in the use of these opportunities.

*Measures.*—Stimulate the incorporation of leisure activities into the school program as an integral part of school work; increase the staff and facilities available for this purpose.

Keep school playgrounds open after school, over week ends, and during holidays. Establish camps under school auspices; make maximum use of young people themselves to construct and operate such camps; develop use of camps during the school year as well as in vacation.

Develop the functions of the school as a community recreation center. Encourage appreciation of the school's responsibility in this area. In renewing school buildings and equipment provide facilities more appropriate for community use.

Increase the support of municipal departments of recreation and establish such agencies in all communities of any considerable size. Provide play lots, play-



grounds, playing fields, and indoor recreation centers which in quality and quantity meet the accepted standards for these facilities. Make supervision and guidance in the use of recreational facilities much more widely available.

#### **Planning**

*Goals.*—To establish and strengthen the planning activities for children and youth at every level of governmental and nongovernmental agency. To achieve the coordination of all governmental and nongovernmental agencies in planning and administering programs for children and youth.

*Measures.*—Bring together at the local level all the agencies serving children and youth. Through a coordinating council representing homes, school, religion, group work, recreation, employment, etc., map

out a comprehensive program of services for the community.

Bring together at the State level through the State planning board or State coordinating council all groups interested in planning and administering sound, long-term program of services and opportunities for the young people of the State.

Take such action as is appropriate to stimulate and coordinate at the regional and national levels conferences of State departments of education, education associations, parent-teacher organizations, colleges and universities, youth work agencies, State departments of health, agricultural and industrial associations, labor, recreational agencies, and others at the State and regional level. Such conferences should canvass the most pressing problems affecting children and youth and lay plans for the improvement of conditions essential to the welfare of young people.

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## APPENDIX A

### TRENDS OF NATIONAL INCOME, EMPLOYMENT AND CONSUMPTION<sup>1</sup>

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#### The Economic Background—1941

The American economy has been expanding with great rapidity for 2 years. We have increased the production of military goods manyfold. At the beginning the pace was slow. But war output is constantly being quickened, has acquired momentum on a wide front. And now the entrance of the United States into active hostilities requires greater effort, larger production, more speed.

During the past 2 years we have also increased the amount of goods and services available to everyone. This increased consumption has been largely incidental to the increased defense effort. The mounting expenditures for ships and planes and factories have circulated through the Nation, making more consumption possible and more private investment profitable.

However, as a Nation we have been slow to realize the character of the task ahead of us. With an economy geared to civil ways, we have been slow to understand military necessity. Objectives have been set too low. Schedules for meeting the objectives have been timed too slow. Even with the raising of objectives and the speeding of time schedules, the process of learning more effective methods and higher tempos is far from completion. By the hard process of trial and error, the Nation is being geared to high levels of military and naval production. Our rates of production have been lifted, our schedules have been speeded up. We have begun to feel the impact of the war economy on our normal ways of life.

The huge increases in activity and in the production of military goods have been possible with slight interruption of normal life because of the vast reservoir of unused manpower in the army of the unemployed which we have maintained for so many years. The productive capacity of those still unemployed remains our first great reservoir of productive power. It will not be exhausted even during the coming year. In addition, there are labor reserves of persons not normally in the labor market on whom we can call if the demands become insistent, and there are further productive reserves to be found in unused techniques of management or organization and in the adoption of new processes.

<sup>1</sup> Prepared under direction of Assistant Director Thomas C. Blaisdell, Jr., by staff and consultants of the Board.

#### National Income

We can measure with a fair degree of accuracy some of the changes which have been taking place. The national income of the American economy, when measured in current prices, has risen sharply during the past 2 years. At the rate of production which obtained in the third quarter of the respective years, it stood at \$70.7 billions in 1939, at \$76.4 billions in 1940, and at \$95.2 billions in 1941. National income thus rose 8.1 percent between 1939 and 1940 and 24.6 percent between 1940 and 1941. It rose from \$77.9 billions in September 1940 to \$97.3 billions in September 1941, a gain of 24.9 percent. Estimated at \$92 billions for the whole year of 1941, it will be higher than ever before in the Nation's history.

The national income in each quarter of the present year has represented an increase over that of the preceding quarter. In the first quarter of 1941 the gain was at the rate of \$4.4 billions per annum; in the second quarter at the rate of \$4.5 billions; in the third quarter at the rate of \$6.3 billions. Income has mounted at a pace more rapid than that attained at any other time for which data are available.

This upward movement may be expected to continue during the years immediately ahead. It is estimated that productive activity, under the stimulus of increasing expenditures for defense, will carry the Nation's income from \$92 billions in 1941 to a figure in the neighborhood of \$106 billions in 1942 and \$124 billions in 1943. If this should happen, income will be 15.2 percent higher in 1942 and 34.8 percent higher in 1943 than in 1941.

Taken at face value, these are striking gains. But the figures are deceptive if taken at face value, since they make no allowance for the fact that the prices in which national income is measured have increased. The rise in national income in recent months becomes less striking when allowance is made for the simultaneous rise in prices.

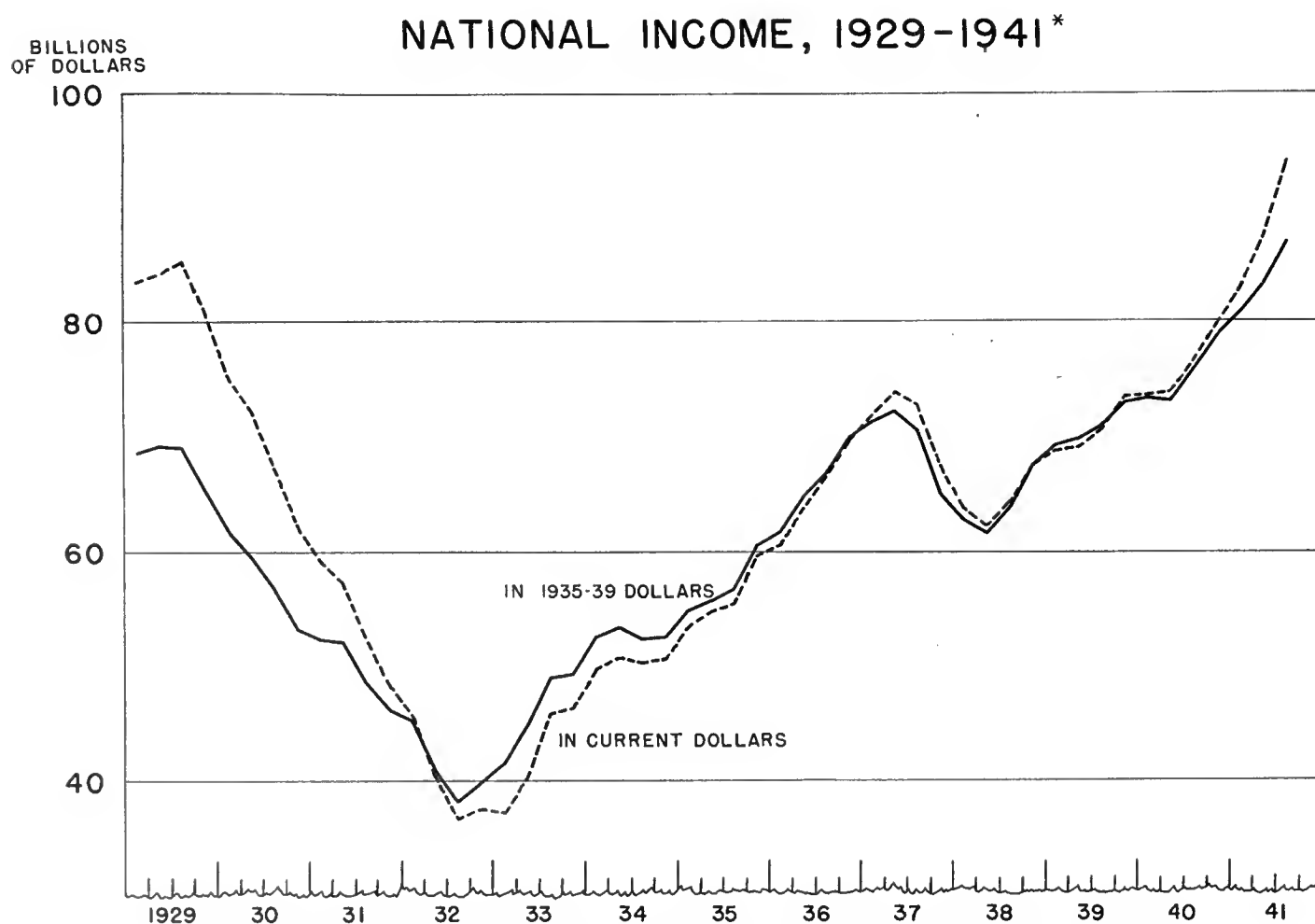
The annual rate at which national income was produced rose, from the third quarter of 1939 to the third quarter of 1940, by \$5.7 billions when measured in current dollars, but by \$4.7 billions when measured in 1939 dollars of constant purchasing power. National income rose again, from the third quarter of 1940 to the third quarter of 1941, by \$18.8 billions in current dollars,

but by only \$12.3 billions in 1939 dollars. Similarly, in each quarter, the apparent gain over the preceding quarter has been in excess of the real gain, the figures standing at \$3.6 billions and \$3.3 billions, respectively, in the last quarter of 1940; at \$4.4 billions and \$3.2 billions in the first quarter of 1941; at \$4.5 billions and \$2.5 billions in the second quarter; and at \$6.3 billions and \$3.7 billions in the third quarter. Price increases have thus accounted for an increasing portion of the gain in each of these periods: for 8.3 percent in the fourth quarter of 1940, for 27.3 percent in the first quarter of 1941, for 44.4 percent in the second quarter, and for 47.6 percent in the third. It is obvious, as this movement proceeds, that each dollar added to the Nation's income will represent a diminishing quantity of goods and services, and that each dollar spent on the defense program will produce a diminishing quantity of the materials required for defense.

Even when due allowance is made for the rise in prices, however, it is found that the real income of the national

economy—the volume of goods and services produced—has increased substantially during the past 2 years. At the rate of production that obtained during the third quarter of the respective calendar years, it stood at \$70.6 billions in 1939, at \$75.5 billions in 1940, and at \$87.8 billions in 1941. National income, after allowance for price increases, thus rose 6.9 percent between 1939 and 1940 and 16.3 percent between 1940 and 1941. In each quarter of the present year it has stood at a figure higher than that recorded in the preceding one. In the first quarter, the gain was 4.1 percent; in the second, it was 3.0 percent; in the third, it was 5.5 percent.

These increases in national income measured in dollars of constant purchasing power come on top of an unbroken series of increases since the middle of 1938. The levels of 1929 that seemed so distant and unattainable during the great depression were excelled during the year beginning with the fourth quarter of 1936; and they have been surpassed again beginning with the second quarter of 1939. By the end of 1940 real income was 14



\* THE INCOME FOR EACH QUARTER IS STATED AS AN ANNUAL RATE AFTER ADJUSTMENT FOR SEASONAL VARIATION.

FIGURE 3

*National Income, by Quarters, 1929-41*  
[Quarterly income data stated as an annual rate]

Period	National income produced (billions of dollars) <sup>1</sup>	Cost of living (1935-39=100) <sup>2</sup>	Real national income (billions of 1935-39 dollars) <sup>3</sup>
1929: 1st quarter.....	83.5	121.9	68.6
2d quarter.....	84.1	121.7	69.1
3d quarter.....	85.2	123.4	69.0
4th quarter.....	80.8	123.4	65.6
1930: 1st quarter.....	75.1	121.4	61.9
2d quarter.....	72.1	120.7	59.7
3d quarter.....	67.0	118.2	56.7
4th quarter.....	62.1	116.8	53.2
1931: 1st quarter.....	59.2	113.2	52.3
2d quarter.....	57.2	109.6	52.2
3d quarter.....	52.5	107.9	48.7
4th quarter.....	48.4	105.1	46.1
1932: 1st quarter.....	45.6	100.7	45.3
2d quarter.....	40.1	98.1	40.9
3d quarter.....	36.7	96.3	38.1
4th quarter.....	37.6	94.3	39.9
1933: 1st quarter.....	37.3	89.9	41.6
2d quarter.....	40.2	89.6	44.9
3d quarter.....	45.9	93.7	49.0
4th quarter.....	46.3	94.2	49.2
1934: 1st quarter.....	49.9	94.7	52.7
2d quarter.....	50.8	95.2	53.4
3d quarter.....	50.2	95.9	52.3
4th quarter.....	50.5	96.2	52.5
1935: 1st quarter.....	53.5	97.6	54.9
2d quarter.....	54.7	98.3	55.6
3d quarter.....	55.4	97.7	56.7
4th quarter.....	59.6	98.4	60.6
1936: 1st quarter.....	60.4	98.2	61.6
2d quarter.....	63.8	98.5	64.8
3d quarter.....	66.5	99.7	66.7
4th quarter.....	69.7	99.7	69.9
1937: 1st quarter.....	71.9	101.0	71.2
2d quarter.....	73.9	102.5	72.1
3d quarter.....	72.8	103.4	70.4
4th quarter.....	67.3	103.7	64.9
1938: 1st quarter.....	63.7	101.6	62.7
2d quarter.....	62.1	100.8	61.6
3d quarter.....	64.2	100.5	63.9
4th quarter.....	67.5	100.2	67.4
1939: 1st quarter.....	67.8	99.4	68.0
2d quarter.....	67.8	99.0	68.2
3d quarter.....	70.7	99.6	70.8
4th quarter.....	76.3	100.8	75.4
1940: 1st quarter.....	73.8	100.4	73.4
2d quarter.....	73.7	101.2	72.6
3d quarter.....	76.4	100.9	75.5
4th quarter.....	80.0	101.3	78.8
1941: 1st quarter.....	84.4	102.6	82.0
2d quarter.....	88.9	104.9	84.5
3d quarter.....	95.2	108.2	87.8

<sup>1</sup> The data on national income produced are based upon the estimates of income payments of the Department of Commerce. National income is stated quarterly as an annual rate. It is based upon monthly estimates of national income corrected for seasonal variation. The data are unpublished estimates of the Department of Commerce.

<sup>2</sup> The index of the cost of living is from the Bureau of Labor Statistics; quarterly averages are obtained from monthly data. Data for months not reported by the Bureau of Labor Statistics were obtained by interpolating the monthly indexes of the National Industrial Conference Board. Beginning with the first quarter of 1939 the index has been spliced to a general price index prepared by the National Resources Planning Board based upon the cost of living, three indexes of construction costs, and an index of machinery prices, combined with changing weights to allow for the decreasing proportion of the national income represented by civilian consumption.

<sup>3</sup> National income divided by the cost of living index.

percent above the 1929 peak. And by the end of the third quarter of 1941 real income was 27 percent above the 1929 peak.<sup>2</sup>

It is reassuring to remember that these all-time high levels are being reached and passed amidst the dislocations and the bottlenecks of war, and that further gains are expected during the next few years. It is estimated that the national income, measured in 1939 dollars, will rise from \$85 billions in 1941 to \$91 billions in 1942 and to \$97 billions in 1943. At these levels, real income will be more than 7 percent higher in 1942 and 14 percent higher in 1943 than it will be in 1941.<sup>4</sup>

### Prices

Prices have risen sharply during the past 2 years. The prices of raw materials have risen most; those of machinery and equipment have been next; the wholesale prices of manufactured goods have risen less; the costs of building construction, still less; the cost of living, least of all. Between January 1940 and September 1941 the spot market prices of 28 basic commodities rose 27.9 percent; those of 16 industrial raw materials included in this group rose 16.4 percent; those of 11 imported commodities 22.2 percent; and those of 7 domestic agricultural products, 36.0 percent. Between the third quarter of 1939 and the third quarter of 1941, the wholesale prices of finished manufactured goods rose 14.2 percent. In September 1941 the prices of machinery and equipment had risen 17.7 percent above the average for 1939; the costs of construction had risen 12.3 percent. The cost of living had risen 7.9 percent above the average for 1940; rents had risen 2.1 percent, the prices of fuel, electricity, and ice 4.0 percent, those of clothing 8.9 percent, those of house furnishings 11.4 percent, and those of foodstuffs 14.7 percent.

Prices have been pushed up by a growth in demand which has not been accompanied by a proportionate increase in the output of certain crucial materials. Thus, military requirements and civilian desires cannot

<sup>2</sup> Even if allowance is made for the growth of population since 1929, real income in both 1940 and 1941 reached all-time highs. Per capita income in 1935-39 dollars was \$560 in 1929, \$580 in 1940, and \$639 in 1941. Thus the level in 1941 is expected to be 14 percent above that in 1929.

<sup>4</sup> A weighted average of the prices of machinery and equipment, the costs of construction, and the cost of living was employed by the National Resources Planning Board in deflating its estimates of national income. This index was 2.9 percent above its 1939 base in the first quarter of 1941, 5.2 percent in the second quarter, and 8.5 percent in the third quarter—7.4 percent in July, 8.2 percent in August, and 9.9 percent in September.

In deflating the figures of future income, it was estimated that the index would rise by slightly more than 15 percent from 1940 to 1942 and by slightly less than 30 percent from 1940 to 1943.

It is likely that these figures understate the extent of the past and probable rise in prices, since none of the currently available price indexes and no combination of these indexes is so designed as completely to reflect the upward movement that has actually occurred.

both be satisfied by the current production of aluminum, copper, zinc, and steel. As such scarcities become apparent and priorities or allocations become necessary, the supply of many finished goods available to consumers must fall short of the rising demand. These shortages may therefore be expected to make for higher prices.

Increases in wages, as well as increases in the prices of raw materials, machinery, and equipment, have added to manufacturers' costs. The index of average hourly earnings of labor in manufacturing rose 11.3 percent and the index of wage cost per unit of output rose 12.5 percent from the third quarter of 1940 to the third quarter of 1941. Though both the prices of manufactured goods and wage costs per unit of output have increased, the causal connection between the two is by no means one-sided. Increasing sales at higher prices have produced growing profits; and these will be substantially above 1940 levels even after payment of the heavy 1941 taxes. With these have been associated general increases in wages. Whether wage increases were stimulated by rising prices, profits, or taxes, or by some combination of these factors, or whether the rising wage and raw material costs were the main causal factors in lifting prices cannot be revealed by the data.

A measure of responsibility for the upward movement of prices must be awarded to our national policies. Higher agricultural prices have been definitely sought. The rise in certain prices must be attributed largely to the legislation which authorizes the Commodity Credit Corporation to lend up to 85 percent of the parity price on certain basic crops. By thus withholding supplies from the market, the farm price of corn was boosted from 61.9 to 70.8 cents per bushel, that of wheat from 62.6 to 95.8 cents per bushel, and that of cotton from 9.23 to 17.53 cents per pound between September 1940 and September 1941. There were similar increases in rice and tobacco prices. The resulting prices bore no functional relationship to the requirements of the emergency, since the supplies of these commodities are more than adequate to meet the prospective demand. On the other hand, higher prices for dairy products, meats, and vegetables have been sought to stimulate production. The rise in nonagricultural prices has been facilitated by a failure to provide statutory authority adequate for establishment of effective control.

### Factors Lifting Income and Prices

Both the increases in business activity and the rise in prices stem from the expansion in the Federal Government's expenditures for defense.<sup>3</sup> These expenditures

<sup>3</sup> The following discussion relates to the Federal Government and its subsidiary corporations and trust funds treated as a unit.

rose from \$1.7 billions in the fiscal year 1940 to \$7.1 billions in 1941 and will approach \$20 billions in 1942, carrying all Federal outlays from a total of \$9.8 billions in fiscal 1940 to \$15.0 billions in 1941 and to \$27 billions in 1942. Increasing expenditures have been financed, in part, by increasing revenues. Federal cash receipts rose from 6.8 billions in fiscal 1940 to \$8.9 billions in 1941 and may reach \$14.0 billions in 1942. The annual cash deficit has mounted rapidly. It rose from \$3.0 billions in fiscal 1940 (met in part by a decrease of \$1.2 billions in the cash balances of the general fund and government corporations) to \$6.1 billions in 1941 (including \$0.7 billion increase in cash balance) and may rise to \$13.0 billions in 1942. The impetus given to economic activity by expenditures of the Federal Government nearly doubled in 1941 and may be doubled again in 1942.

Increasing private investments have also contributed both to activity and to the upward movement of prices. Expenditures on machinery and equipment, under the stimulus of the defense program, amounted to \$5.6 billions in 1940, a peak as high as that reached in 1929. It is estimated that they will rise to \$9.0 billions in 1941, a gain of 61 percent. Manufacturers' inventories rose 37.8 percent between December 1938 and September 1941; inventories of manufacturers of nondurable goods rose 24.0 percent, and inventories of manufacturers of durable goods rose 50.6 percent. Private expenditures for building construction stood at \$6.1 billions in 1940; it is estimated that they will amount to \$7.5 billions in 1941, the growth in residential building accounting for half of the gain. The financing of installment sales of consumers' durable goods had carried consumers' credit to an all-time high of \$10.2 billions by the middle of 1941.

The prospective decline in the volume of installment credit will result mainly from the scarcity of raw materials which can be made available for the production of those consumer goods ordinarily sold on the installment plan rather than to the recently imposed restrictions upon installment selling.

### Employment

The ability to expand output during the past few years has rested on an unused labor supply. Plant expansion has been necessary in some sectors, such as electric power, but by and large no great additions have been necessary to meet civilian requirements. On the other hand, defense demands have placed heavy burdens on such industries as chemicals, ordnance, munitions, and airplanes. They and their related industries have had to expand at a tremendous rate.

However, labor supplies have been readily available, and the volume of employment has expanded. The numbers of those employed rose from 48.7 millions in



September 1940 to 51.8 millions in September 1941, a gain of 3.1 millions.

Increase in employment results in increase of total output, and therefore in increase in the volume of real income. But an increase in income need not be associated with a proportionate increase of employment. Hours of labor may be lengthened. The volume of employment may grow more rapidly in those industries where labor is most productive. Output per man-hour may be stepped up. Thus, between September 1940 and September 1941 real income rose by 13.6 percent, employment by only 6.3 percent.

Expansion in employment has been accompanied by pronounced changes in the occupational distribution of labor. Agricultural employment in the month of September fell from 11.4 millions in 1940 to 11.0 millions in 1941, a loss of 3.5 percent. Nonagricultural employment rose from 37.0 millions to 40.7 millions, the highest figure on record, making a gain of 10 percent. The numbers of the self-employed, in the same period, declined by 1.9 percent. The number of workers engaged in finance, in personal service, in trade, and in government rose less than did the average for nonagricultural activities. The numbers of those engaged in transportation and utilities, in mining, in manufacturing, and in construction rose more than did the average. Employment in manufacturing mounted from 10.5 millions to 12.3 millions, a gain of 17.1 percent; employment in construction from 1.5 millions to 2.0 millions, a gain of 33.3 percent.

The most rapid increase in any occupational category has occurred, of course, in the military and naval establishments, where numbers grew from 600 thousands to 2 millions, more than tripling between September 1940 and September 1941.

The most striking increases in manufacturing employment were recorded in industries producing for defense. From September 1940 to September 1941, employment rose by 21 percent in blast furnaces, steel works, and rolling mills, by 27 percent in plants producing chemicals, by 30 percent in those producing stamped and enameled wares, by 33 percent in those producing brass, bronze, and copper goods, by 40 percent in foundries and machine shops, by 44 percent in establishments making machine tools, by 52 percent in the manufacture of electrical goods, and by 77 percent in the production of engines. The greatest gains in both absolute and relative terms were those realized in the aircraft industry, where employment rose 128 percent, and in shipbuilding, where it rose 136 percent.

The extraordinary demands of the emergency have created shortages of labor for certain skilled and semi-skilled occupations in industries producing for defense. These shortages have been particularly acute in shipbuilding, in the manufacture of aircraft, and in the pro-

duction of machine tools. As much as 75 percent of the labor required in such industries must be skilled or semi-skilled. But less than 40 percent of the supply of unemployed workers falls into these categories.

The need for skilled labor has been met in part by a broad program of training instituted by different agencies, such as the Department of Labor, the Office of Production Management, the Work Projects Administration, the United States Office of Education, and the National Youth Administration. "Refresher" courses for unemployed workers whose skills had become rusty from disuse during the depression, and other courses designed for the upgrading of semiskilled and unskilled employees, for the training of engineers and other technicians, and for the instruction of unemployed youths have been inaugurated. More than 1.5 million persons enrolled in such courses between July 1, 1940, and June 30, 1941. This program has been supplemented by the efforts to promote training within industry. More workers are now receiving training, and instruction is being given at a higher speed, than at any previous period in our industrial history.

The movement of labor from agriculture, retailing, the service trades, and other peacetime activities into defense occupations has been induced in part by the payment of relatively high wages. The average weekly wage in manufacturing industries not engaged in production for defense was \$28.21 in May 1941; the average wage in defense industries was \$38.47. (This difference reflects in part higher wage rates, in part extra pay for overtime, and in part higher ranges of skill.) The provision of greater opportunities for training has also enabled many workers to shift from unskilled and semi-skilled occupations into those requiring higher degrees of skill.

It is to be expected that the volume of employment will continue to grow during the next few years. It is estimated that the number of persons in nonmilitary, nonemergency employment will increase by another 2.4 millions between 1941 and 1943.

This increase in employment will involve a further redistribution of the labor force. Rising costs of construction and shortages of materials will curtail employment in normal residential and commercial building. Similarly, shortages of finished goods will curtail employment in the distribution trades. At the same time, growing defense expenditures will increase employment in mining, in transportation and utilities, in manufacturing, and in government. It is estimated that there will be 800,000 fewer workers in normal construction and activities and 400,000 fewer in trade in 1943 than there were in 1941, but that there will be 200,000 more in financial, service, and miscellaneous occupations, 200,000 more in mining, 300,000 more in transportation and utilities, 300,000 more in govern-

ment, and 2.3 million more in manufacturing. It is believed, moreover, that the major part of these changes will occur during 1942.

Every section of the United States has participated in the recent growth of employment. But some sections have gained far more than others. The greatest relative gains in nonagricultural occupations between the third quarter of 1940 and the third quarter of 1941 occurred in Virginia, Rhode Island, Indiana, Connecticut, Alabama, and Maryland. But the greatest absolute gains occurred in New York, Pennsylvania, Illinois, California, Massachusetts, and Michigan. These latter seven States, with more than half of the total number of nonagricultural employees, accounted for more than half of the gain in employment recorded during this period. A review of the location of defense contracts, while not conclusive, indicates heavy concentration of contracts in these same areas. The defense program thus appears to have supported the existing concentration of industrial activity, and perhaps even to have contributed to it. This development has taken place in spite of the attempt to decentralize defense plants which are financed by the Federal Government. The concentration of defense contracts within the larger business establishments is much more marked than the concentration of contracts within the major industrial areas.

The most rapid growth in manufacturing employment has occurred in the metropolitan centers of industrial areas where the volume of defense contracts has been large. Between July 1940 and July 1941 the increase in 21 cities was more than 40 percent; in 12 it was more than 50 percent; and in 4 it was more than 75 percent. Such growth necessitates the provision of additional facilities for housing, transportation, education, and recreation. It presents these communities with pressing problems during the emergency, and it cannot fail to present most of these communities with difficult problems of adjustment in the post-war period.

Unemployment has fallen less than employment has risen. The volume of unemployment cannot be computed simply by subtracting the increase in employment from the previous numbers of the unemployed since allowance must also be made for changes in the total labor supply. The size of the labor force, which normally comprises about four-fifths of the men and one-fourth of the women of working age, fluctuates from month to month and from year to year. It grows during the summer as students seek gainful employment and contracts in the autumn as they return to school. It grows each year as changes in the size and in the age composition of the population add to the numbers of those who are employable. It may grow with more than normal rapidity as increasing demand induces employers to utilize previously undesired reserves. Thus,

in recent months, employers have hired women to fill jobs that were formerly closed to them, and have modified the specifications covering age, race, physical condition, intelligence, personality, and experience used in the selection of employees. This development, however, has been offset in part by the tendency of married women to retire from gainful employment as their husbands find work at better wages. It is estimated that the net effect of these factors has been to increase the labor force from 55.8 millions in September 1940 to 56.3 millions in September 1941, a gain of 0.9 percent.

The amount of expansion the labor force will undergo over its present size when an all-out effort for defense production is made is difficult to forecast. Such an expansion can be brought about through patriotic appeals and other incentives to enter the labor force such as high wage rates. The ultimate size of the labor force will depend largely upon the number of men in the naval and military forces. This perhaps will be the largest single determining factor. Assuming that there will be 7½ million men in the military forces and 2½ million men unemployed at the peak of the defense effort, some idea of the ultimate size of the labor force may be obtained by adding 10 million workers to the existing labor force (including military forces) as of April 1940, and assuming that the ultimate labor force for all the subsequent months would increase to 66 million as of September 1941. If an emergency had existed during these months, between 55 and 56 million workers could have been employed on the average over the period. This follows from the assumption that every worker entering the military and naval forces would have been replaced by unemployed workers now in the labor force and workers outside the labor force. It is difficult to predict from what groups of persons of gainful worker age and in what numbers these workers will be recruited or what methods will be used to induct persons not considered as gainful workers into the labor force. It should be noted, however, that as the labor force expands, it will become increasingly difficult to recruit workers from the nongainful worker group.

The volume of unemployment measured in terms of those out of work, able to work, and looking for work has declined sharply. Only 500,000, or 17 percent, of the 3.1 million persons given new employment between September 1940 and September 1941 were drawn from additions to the labor force; 2.6 millions, or 83 percent, came from the ranks of the unemployed. The volume of unemployment fell during this period from 7.1 millions to 4.5 millions, a decline of 36.6 percent.

In the 4.5 millions of unemployed in September 1941 there may be approximately a million who have been laid off temporarily or who are in the process of shifting from job to job, of whom nearly 600,000 are receiving unemployment compensation benefits. Of the remain-

ing 3.5 millions, nearly 1.5 millions were engaged on emergency work projects in September 1941 as compared with 2.2 millions in September 1940. The remaining 2 millions are, as a group, steadily becoming less employable as the younger and abler members are

finding work. Many of those unable to get jobs are physically below par, undernourished, and low in morale. They will require training and rehabilitation before they are able to take their productive places in industry.

## THE LABOR FORCE

APRIL 1940–SEPT. 1941

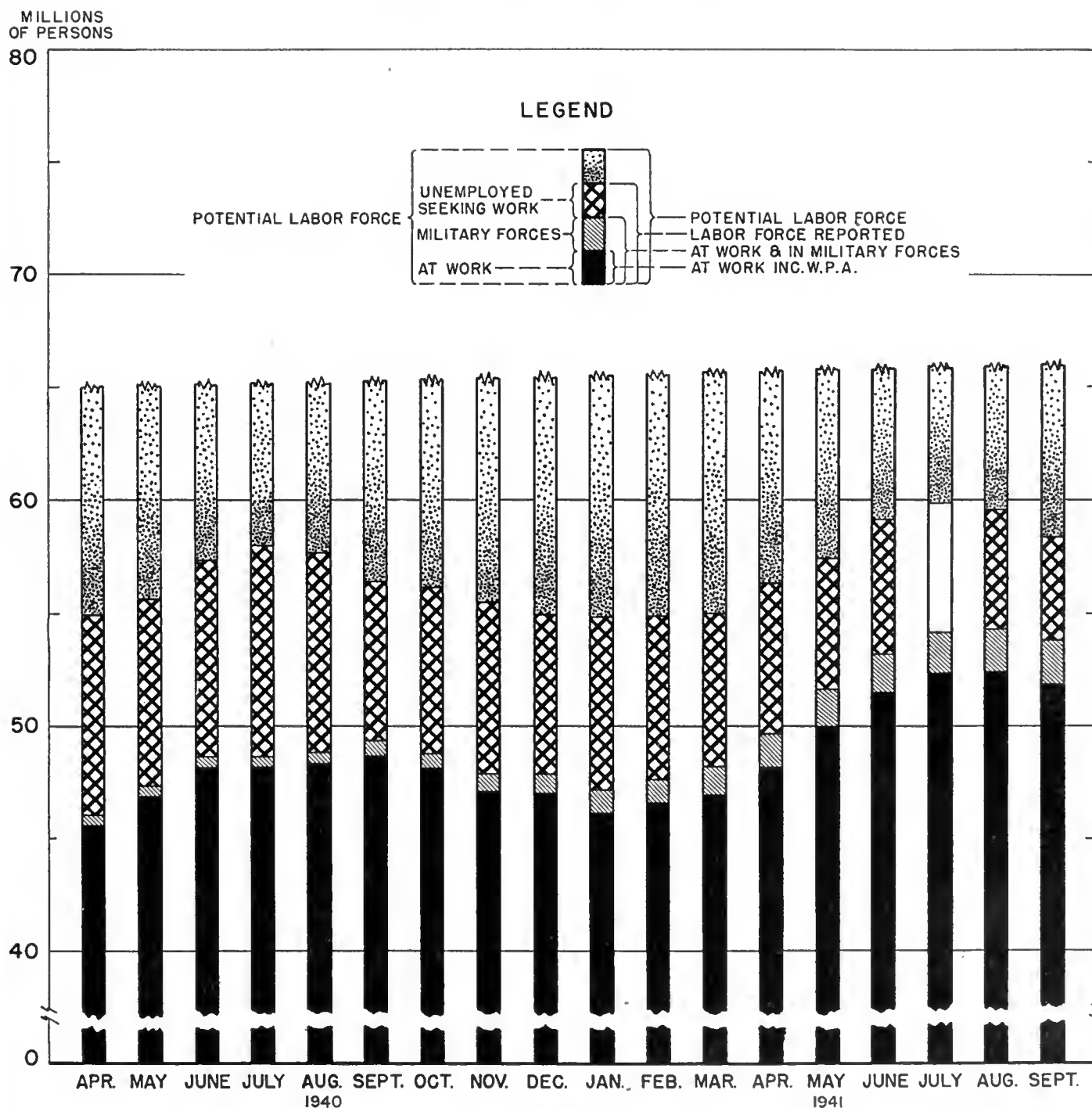


FIGURE 4

*The Labor Force*<sup>1</sup> April 1940—September 1941

[Millions of persons]

Year and month	Total employment				Unem- ployment
	Total	Employ- ment	Employment in military and naval forces	Employment on work relief WPA, NYA, and CCC	
1940					
April.....	48.8	45.1	0.5	3.2	5.6
May.....	49.8	46.3	.5	3.0	5.4
June.....	50.8	47.7	.5	2.6	6.0
July.....	50.3	47.7	.5	2.1	7.2
August.....	50.5	47.8	.5	2.2	6.7
September.....	50.9	48.1	.6	2.2	4.9
October.....	50.7	47.4	.7	2.6	4.8
November.....	49.9	46.3	.8	2.8	4.8
December.....	49.8	46.1	.9	2.8	4.3
1941					
January.....	49.2	45.2	1.0	3.0	4.6
February.....	49.7	45.5	1.1	3.1	4.1
March.....	49.8	45.6	1.3	2.9	3.9
April.....	50.9	46.7	1.5	2.7	3.9
May.....	52.5	48.3	1.7	2.5	3.2
June.....	53.8	49.8	1.7	2.3	3.6
July.....	53.8	50.4	1.9	1.5	4.1
August.....	53.9	50.5	1.9	1.5	3.8
September.....	53.3	49.8	2.0	1.5	3.0

<sup>1</sup> Estimates by National Resources Planning Board from data of various government departments.

**Consumption**

The effect of rising employment and real income upon the well-being of the American consumers depends upon the amount of the growing output available for their consumption. If a rapidly increasing portion of our total output consists of goods which are not available for immediate human consumption, for example, battle-ships, tanks, and factories, the general level of living may be impaired. If a rapidly increasing portion of our output of consumers' goods is sent abroad to bolster the consumption of our allies, our general level of living may be impaired.

Some impairment of our high standard of living would not affect the efficient prosecution of the war. Indeed, it might help to sustain industrial activity after the war by creating backlogs of consumer demand. On the other hand, the standard of living is related to productive efficiency. Adequate diet, clothing, medicine, and transportation are essential to efficient output. The increase in consumption during the period when the country was mobilizing its resources provided reserves which will be more and more appreciated as the war progresses.

During the initial phase of the defense effort, the volume of consumers' goods and services has risen to figures higher than any previously attained. Consumers' outlays for services, while rising less rapidly than national income, have grown steadily. In September 1941 they were 17.5 percent above the average

for 1939. Consumers' outlays for goods, as measured by the volume of retail sales, grew as rapidly as national income during 1939 and 1940 and more rapidly than national income during the first 8 months of 1941. In August 1941 they were 37.5 percent above the average for 1939. Expenditures for residential construction rose from \$2.1 billions in 1940 to \$2.8 billions in 1941. The number of dwelling units completed during the first 6 months of the year rose from 243,000 in 1940 to 319,000 in 1941.

It is not to be expected, however, that this level of expenditure can or should be maintained. The rapid expansion of retail trade during the first part of 1941 was undoubtedly induced to a large extent by the prospect of future shortages, higher prices, excise taxes, and backlogs from earlier years. While the early fall of 1941 showed a relative relaxation in the rate of retail sales, it is clear that demands for consumer goods will remain high in the face of the reduction in the output of such durable consumers' goods as automobiles and refrigerators. Residential construction will also decline; it is estimated that expenditures for this purpose will fall from \$2.8 billions in 1941, to \$2.1 billions in 1942, and to \$600,000 in 1943.

There is evidence which suggests that savings have risen more rapidly than either income or consumption. Savings through seven major financial channels, which amounted to \$3.9 billions in 1939 and \$4.2 billions in 1940, were made at the rate of \$6.6 billions per annum during the first 9 months of 1941. They were 90 percent higher in the third quarter of 1941 than they had been in the corresponding quarter of 1940. A large part of this increase is accounted for by sales of United States Savings Bonds, which amounted to \$2.3 billions during the first three quarters of 1941. Of the total savings made through these channels in this period, approximately 39 percent was saved through savings bonds, 31 percent through life insurance, and 15 percent through savings and loan associations, member banks of the Federal Reserve System, mutual savings banks, and postal savings accounts. The portion of such savings made through savings bonds grew from about 28 percent of the total in the first quarter of the year to 42 percent in the second, and to more than 44 percent in the third. An increasing share of the growing volume of savings was thus channeled directly toward the financing of national defense.

**Production**

The recent gain in real income is to be attributed principally to the growth of industrial output. Agriculture, finance, real estate, trade, and service undertakings have lagged relatively to mining, manufacturing, construction, transportation, and the utilities, which have raced ahead. Industrial production ad-

vanced more rapidly than real income throughout 1940 and during the first 6 months of 1941. Production rose 14 percent and income 7 percent in 1940; production rose 13 percent and income 6 percent in the first half of 1941. In the expansion of industrial output, moreover, durable goods have outrun nondurable goods. In 1940, manufacturers' shipments of durable goods rose 43 percent, their shipments of nondurable goods only 13 percent. During the first half of 1941, shipments of durable goods rose 33 percent, those of nondurable goods rose 24 percent. The most spectacular gains have been achieved in certain industries producing for defense; for example, the production of ships was tripled between the beginning of 1940 and the summer of 1941.

It is obvious that the growth in the supply of consumers' goods and services has been less than proportionate to the growth in industrial output.

It is not likely that production will rise as rapidly in 1942 and 1943 as in 1940 and 1941. The fact that new orders for manufactured goods, since the middle of 1940, have outrun the shipments of such goods indicates the existence of a considerable volume of unsatisfied demand. But production in many fields has already run close to the limits set by available supplies of productive facilities, raw materials, and skilled labor. New orders for durable goods declined in the third quarter, a development that may be attributed in large part to the inability of manufacturers to make shipments. Such shipments were smaller in July, August, and September than they had been in June. Shipments of nondurable goods, however, continued to grow.

It is probable that the index of production understates the actual gain in the output of durable goods, since it affords inadequate representation to equipment produced for the Army and the Navy. But it is still true that capacity in this field is limited, and that continued and speedy expansion in the military and naval program necessitates the conversion on a large scale of facilities which are now engaged in the production of consumers' goods.

Prosecution of the war is commanding an increasing share of public expenditures and an increasing share of national income. Defense outlays accounted for 17 percent of the expenditures of the Federal Government in the fiscal year 1940, and similar expenditures, will account for 74 percent in fiscal 1942. Defense expenditures took only 2.3 percent of national income in the fiscal year 1940 and 8.7 percent in 1941; they will take at least 20 percent in 1942 and 33 percent in 1943.

### Imports and Exports

The acceleration of industrial activity and the war have revolutionized the character of our international

trade. Imports into the United States increased 46 percent in value and 26 percent in volume between the third quarter of 1939 and the third quarter of 1941. Exports from the United States increased 60 percent in value and 36 percent in volume in the same period. The Government's share in this trade has risen sharply. Negligible in 1939, it rose from 3.2 percent in the third quarter of 1940 to 14.1 percent in the third quarter of 1941.

This development has been reflected in the changing composition and direction of the import trade. The share of imports which consists of strategic and critical materials has risen, mounting from 27.3 percent in the third quarter of 1939 to 37.7 percent in the third quarter of 1941. An increasing fraction of the imports of such commodities as rubber, tin, copper, and raw wool has been acquired by the Government in pursuance of its stockpile program. A declining portion of all imports has come from Continental Europe and the United Kingdom, an increasing portion from Asia, Latin America, and the British Empire.

Even greater changes have characterized the export trade. Exports of farm products have declined to the lowest figure recorded in 69 years; they constituted only 9 percent of total exports in fiscal 1941. Exports of war materials have risen, mounting from 10.8 percent of the total in the third quarter of 1939 to 27.1 percent in the third quarter of 1941. Exports of air-craft, motor vehicles, explosives, firearms, and ammunition, machinery, and iron and steel products have made the most striking gains. More than three-fifths of the commodities exported in the third quarter of 1941 consisted of war materials and war-related goods.

A declining share of exports has gone to Continental Europe and to Asia, an increasing share to Latin America and to the British Empire. Exports to Latin America rose 72 percent between the third quarter of 1939 and the third quarter of 1941; they constituted 17.5 percent of all exports made in the latter 3-month period. Exports to Canada rose 90 percent, those to the United Kingdom 183 percent, and those to Africa 360 percent in the same 2 years. The United Kingdom took 33 percent and the British Empire, as a whole, took 71 percent of the goods exported from the United States in the third quarter of 1941. The share of exports made under the provisions of the Lend-Lease Act is increasing; it rose from 4.8 percent of the total in the second quarter of the year to 17.4 percent in the third.

It is apparent that the growth in foreign trade has been directed largely toward fulfillment of the requirements of a war economy. Imports increasingly come to consist of strategic and critical materials, and exports of military equipment and war-related goods.

### Scarcities and Priorities

The magnitude of the defense program and the rapidity of its development have caused demand to outrun existing capacity in many fields. The production of steel has been retarded by a serious shortage of scrap. The production of aluminum is insufficient to provide for military needs. The output of copper will fall short of the amount required to satisfy both military and civilian demands. The output of zinc will be short both in 1941 and in 1942. While the railroads have so far been able to meet the demands imposed upon them, their supply of rolling stock may not be large enough to move the goods produced in 1942 and 1943. Present and projected capacity for the generation of electricity may likewise prove to be inadequate to satisfy the growing demand for power.

Such bottlenecks have already necessitated the rationing of scarce supplies. This has been accomplished, in the main, by the issuance of priority orders, which have given firms producing for defense a preference in obtaining equipment and materials or have limited the permissible output of nonessential goods.

It is to be accomplished increasingly through a system of allocations, which will assign specific quantities of scarce materials both to firms producing for defense and to those producing for civilian needs. Priority orders have already curtailed the output of automobiles, mechanical refrigerators, domestic ice refrigerators, and domestic laundry equipment. A conservation order has virtually forbidden the use of copper in building construction and in the production of more than 100 civilian goods. If expansion in output for defense is not to be impeded, further restrictions will have to be imposed.

In the initial phase of the defense effort it was possible simultaneously to increase the production of military and naval equipment and the distribution of consumers' goods. In the later phases, it is no longer possible to do so. It is to be expected that the supplies of many goods available to consumers will be drastically curtailed.

However, such curtailment must be replaced by an ever growing production of military goods. Only thus can the whole Nation make its strength available to bring about ultimate victory.



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## APPENDIX B

### RECOMMENDED SIX-YEAR PROGRAM

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#### FEDERAL CONSTRUCTION AGENCIES (CLASS I)

The 6-year program of public works construction for the construction agencies (Class I)<sup>1</sup> of the United States Government as presented in this section is divided into three parts:

The first part (Table I) consists of projects recommended for construction during the fiscal year ending June 30, 1943.

The second part of the program (Table II) consists of surveys under way as of December 1, 1941, or completed since December 1, 1940, which have led or may lead to the development of further projects to be included in the Government's construction program.

The third part of the program (Table III) summarizes those projects available for construction for the years following the fiscal year 1943.

The "shelf," or "reservoir," or "backlog"—whichever term may be preferred—of public works construction, insofar as the construction agencies (Class I) of the Government are concerned, consists of the following parts of Tables I, II, and III:

1. The additional expenditures that will be required in the years after fiscal year 1943 to complete non-defense projects recommended for construction in 1943 in Table I. These additional expenditures amount to approximately \$1,500,000,000.

2. The estimated cost of projects now under survey as listed in Table II. Assuming all these projects are favorably reported upon, their total estimated cost would be approximately \$750,000,000.

3. The estimated cost of projects upon which favorable survey reports have been completed during the past year as listed in Table II. Eliminating such of these projects as are listed in Table III, this total estimated cost would be approximately \$240,000,000.

4. The estimated cost of projects available for construction in later years as listed in Table III. This cost totals \$3,870,000,000.

Thus, the "shelf" of projects available now for undertaking in the post-war period by the construction agencies (Class I) of the Federal Government alone totals about \$6,360,000,000.

**Table I.—PROJECTS RECOMMENDED FOR FISCAL YEAR 1943**

This table includes the projects recommended for construction by the construction agencies (Class I) during the fiscal year 1943 in the Budget of the United States Government. The total expenditure of \$5,817,000,000 that is recommended does not include allotments from work relief funds, these being reported separately in Table IV under the work relief agency involved.

The total estimated cost of the projects, excluding those projects listed under national defense, recommended for construction by the construction agencies (Class I) during the fiscal year 1943 is almost \$6,500,000,000, of which it is estimated that about \$3,750,000,000 will have been spent prior to June 30, 1942, and about \$1,515,000,000 will be required to complete the projects in the years following the fiscal year 1943. The distribution of the expenditure of \$1,515,000,000 in the fiscal years following 1943 cannot be forecast with any accuracy, since the amounts involved will

ultimately depend upon the future decisions of the President and the Congress. Furthermore, it should be made clear that this estimate of expenditures for the fiscal years after 1943 does not all represent contractual commitments. A proportion of such expenditures are, of course, covered by continuing contracts, while the balance represents a plan on the part of the construction agencies to complete projects, subject to the decisions of the President and the Congress.

Viewed from another standpoint, the additional expenditures that will be required in the years after 1943 to complete projects recommended for construction in 1943 provide one part of the "shelf" of public works construction required by the Employment Stabilization Act of 1931. Of course, as it has been noted previously, other parts of that reservoir consist of those projects under survey, which are listed in Table II, and those projects upon which construction is not recommended during the fiscal year 1943, but upon which surveys have been completed and which are available for construction during later years, as shown in Tables II and III.

The largest share of the recommended expenditure for construction in 1943 is for direct national defense pur-

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<sup>1</sup> Construction agencies (Class I) as defined by Executive Order No. 8455 include those that "plan, initiate, undertake, or engage in construction financed in whole or in part by the Federal Government, by contract, force account, Government plant and hired labor, or other similar procedures."

poses in the amount of \$4,600,000,000. Housing projects, providing shelter and quarters for national defense workers, are the next largest, the amount being \$429,500,000. Land development and protection works and projects providing transportation facilities follow in order at \$266,000,000 and \$200,000,000, respectively.

For comparative purposes, a classification of the construction expenditures during the past ten fiscal years of the construction agencies (Class I) according to the general purposes the projects serve is as follows:<sup>2</sup>

[All figures in thousands of dollars]

Fiscal year	National defense	Land development and protection	Promotion of transportation	Power generation and distribution	Welfare and health	Government Administration	Housing	Miscellaneous	Total
1934.....	\$50,076	\$101,323	\$90,495	\$9,464	\$9,930	\$87,031	\$2,377	\$4,205	\$354,901
1935.....	48,377	124,740	144,490	32,568	9,870	66,138	9,014	8,000	443,197
1936.....	31,837	172,033	159,702	48,205	12,666	74,841	33,607	12,345	545,236
1937.....	42,729	197,967	156,322	40,145	23,055	93,827	99,992	6,871	660,908
1938.....	49,354	170,151	113,384	43,707	16,640	84,894	79,421	7,183	564,734
1939.....	109,593	203,970	105,024	43,193	28,311	64,074	9,487	20,495	584,147
1940.....	153,900	236,349	93,653	52,516	33,200	68,811	6,024	19,661	664,114
1941.....	1,605,885	234,239	97,247	73,496	12,643	63,260	83,517	13,890	2,184,177
1942.....	4,508,459	221,585	296,848	188,100	13,845	80,126	502,732	69,433	5,881,128
1943.....	4,600,000	266,123	200,031	188,539	8,757	44,505	429,500	79,987	5,817,442

In order to provide some view of the relationship of the projects recommended for construction in 1943 to the development plans and programs of the construction agencies, there are presented in the following notes brief explanatory data on the principal features of the projects recommended for construction in 1943. These notes have been arranged in the order of the listing of the material in the Table. The listing of projects in the Table is grouped according to the following general purpose classification:

1. *National Defense*—includes only military camps and cantonments, Army air bases, armories and barracks; Naval bases, air stations, Naval yards and docks; and defense industrial plants covering Army and Naval ordnance and Maritime Commission shipyards.

2. *Land Development and Protection*—includes flood control, irrigation, reclamation, forests, national parks, soil conservation, wildlife, and range land conservation.

3. *Promotion of Transportation*—includes highways, roads and streets, river and harbor development, canals, aids and assistance to navigation, airports and airways, and railroads.

4. *Power Generation and Distribution*—includes hydroelectric developments, steam plants, and transmission and distribution lines.

5. *Welfare and Health*—includes eleemosynary insti-

tutions, prisons, and hospitals and other health facilities.

6. *Government Administration*—includes Government office buildings, post offices; law enforcement buildings, such as border patrol stations; experiment stations, research stations, laboratories; and construction necessary for surveys and investigations.

7. *Housing*—includes public housing.

8. *Miscellaneous*—includes types of works and structures not classified above or not classifiable because of the data.

## National Defense

The estimated expenditure of \$4,600,000,000 for the fiscal year 1943 which is contained in Table I covers only those national defense construction expenditures which are for direct military or naval purposes. Obviously, other purpose classifications in the Table cover expenditures which are made to aid in the war effort. For instance, flood control reservoirs of the Corps of Engineers which provide hydroelectric power to supply ordnance plants, the multiple purpose irrigation works of the Bureau of Reclamation which provide electric energy for defense-industrial power needs, the Federal office buildings constructed by the Public Buildings Administration to house civilian employees of the defense-management agencies, and the housing projects being built to house the families of military and naval personnel and defense industrial workers—all of these aid and expedite the national defense. So also do those projects which protect the health and safety of the nation in general.

However, for the purposes of Table I, a strict interpretation has been placed on the term "national defense," and the only expenditures included within the classification are the direct military, naval, and defense-industrial plant construction expenditures. Furthermore, for reasons of national security, no details of the estimated expenditures are shown beyond the three items of military facilities, naval facilities, and production facilities.

It should be particularly noted that the estimated expenditures shown for 1943 are subject to great change depending on the conditions that develop as the war continues. Also, attention is called to the fact that the estimate of \$4,600,000,000 for the fiscal year 1943 does not cover all the national defense construction expenditures and financing by the Government—even using "national defense" in its strictest sense. Disbursements on loans and expenditures by the Reconstruction Finance Corporation, a construction agency (Class II), on defense industrial plants are shown in Table IV.

<sup>2</sup> Figures shown for years prior to 1942 are actual expenditures. Figures for 1942 and 1943 are estimated.

## Land Development and Protection

### Flood Control

Jurisdiction over general flood-control problems is divided between the War Department and the Department of Agriculture. For the War Department, the Corps of Engineers is charged with investigations and improvements of rivers and harbors and other waterways for flood control. Investigations and improvements of watersheds for run-off and waterflow retardation and soil-erosion prevention are under the jurisdiction of the Department of Agriculture.

The flood-control program of the War Department calls for an expenditure of \$166,800,000 in the fiscal year 1943. Preference is given to those projects considered vital to the war effort—multiple-purpose projects which, in addition to providing substantial flood protection to essential war industries, will provide for installation of hydroelectric facilities and for necessary industrial water supplies. The most prominent projects to be prosecuted in the coming fiscal year are:

1. The Denison Reservoir, Tex. and Okla., at which an installed capacity of 70,000 kw. is scheduled for completion in 1944.

2. The Norfork Reservoir, Ark., scheduled to provide 60,000 kw. of installed capacity by 1943.

3. The Wolf Creek Reservoir, Ky., which is designed to afford substantial protection for important industries at Nashville, Tenn. Though no power has been authorized to date, it is anticipated that an installed capacity of 125,000 kw. can be obtained by 1946.

4. The Markham Ferry and Fort Gibson Reservoirs in Oklahoma, which together should provide 60,000 kw. of installed power in 1943.

5. The Bluestone Reservoir in West Virginia, scheduled to provide an installed capacity of 60,000 kw. by 1943. The Reservoir will also provide substantial flood protection for industries in Charleston, W. Va., important to the war effort.

6. The Berlin Reservoir in Ohio, designed to provide flood protection and to assure sufficient flow during dry periods for the benefit of Youngstown and the highly industrialized valley of the Mahoning River.

7. Allatoona Reservoir in Georgia, at which a power installation of 33,000 kw. should be completed by 1944.

8. Center Hill and Dale Hollow Reservoirs, Tenn., which will provide an initial installed capacity of 100,000 kw. by 1944.

The Department of Agriculture plans to continue construction on one large watershed project during the fiscal year 1943 involving an expenditure of approximately \$225,000. This project constitutes only a small part of the flood-control program now under survey by the Department, which according to present figures will entail the expenditure ultimately of approximately \$300,000,000.

The Department of State, through the activities of the International Boundary Commission, is in charge of flood-control projects on the Rio Grande River along the Mexican Border. For the fiscal year 1943, the Commission contemplates expenditures of about \$1,000,000 on the lower Rio Grande Flood Control project. This project, which is now under construction, will provide flood protection for the highly developed agricultural area of the Rio Grande Valley. The Rio Grande Canalization project, from El Paso, Tex., to the Caballo Dam in New Mexico, will be completed in 1943 with the expenditure of \$230,000. The program of the Commission for construction in future years, now under study, includes canal and dam projects for water-use and flood control at various places along the border.

### Irrigation and Reclamation

The major emphasis of the program of the Bureau of Reclamation for the fiscal year 1943 is the construction of power facilities for national defense. The program includes only multiple-purpose projects in which power is an important aspect or projects in such an advanced state of completion that, in the interests of economy, they should be finished as soon as practicable.

The Boulder, Parker, and Davis Dams on the Colorado River constitute an interconnected system of power generating facilities which will aid materially in meeting the large requirements of the next few years. The installed power capacity of Boulder Dam alone will be well over 1,000,000 kw. by 1943. It is proposed to complete Unit 4 at the Parker Dam in 1943 and thereby provide for the national defense industries in the region an additional 30,000 kw. The Davis or Bullshead Dam is now under construction and is scheduled to make available 90,000 kw. of installed capacity by 1945 and an additional 90,000 kw. in 1946. For the fiscal year 1943, \$10,200,000 will be expended on these projects.

The Central Valley project in California will be a large source of energy supply. By the end of 1944, it is estimated that the installed capacity at Shasta Dam alone will be 375,000 kw. The total expenditures for the Central Valley project in the fiscal year 1943 are estimated at \$45,000,000.

The Grand Coulee Dam in Washington, also under construction by the Bureau of Reclamation, will have an ultimate installed power capacity of almost 2,000,000 kw. The distribution and sale of power from this dam is currently handled by the Bonneville Power Administration, which is responsible for construction of the transmission facilities. The present estimated schedule for installed capacity at Grand Coulee through 1944 is:

1941—128,000 kw.

1942—344,000 kw.

1943—668,000 kw.

1944—992,000 kw.

All units required to produce this power are authorized and on order. Expenditures on the Grand Coulee Dam will total \$18,000,000 in the 1943 fiscal year.

In addition to the three large projects just discussed, the Bureau of Reclamation proposes construction in 1943 at two other multiple-purpose projects, which have, as one of their purposes, the generation of hydro-electric power:

The Green Mountain Dam of the Colorado-Big Thompson project is scheduled to produce power for defense purposes on the western slope of the Continental Divide. By the end of the 1943 fiscal year, 10,800 kw. of installed capacity should be available.

The Anderson Ranch Dam in Idaho will provide 30,000 kw. installed capacity in 1946. \$2,000,000 will be expended on continuing construction of the dam in the 1943 fiscal year.

The defense program in Salt Lake and Provo areas in Utah has noticeably increased the demand for irrigation water for food supplies and municipal water for domestic purposes. To meet these needs, construction is being expedited on the Provo River project.

In 1940, under authority of the Wheeler-Case Act, the Bureau of Reclamation inaugurated the Water Conservation and Utilization program for the construction of small dams and reservoirs to conserve the off-season runoff for irrigation use during the growing season. Whereas the large reclamation projects, in accordance with the Reclamation Law, are built to provide new opportunities for an increasing population and are self-liquidating in that the irrigation portion of the construction costs is borne entirely by the water users, the projects under the new program are undertaken primarily to enable farmers who abandoned their properties during the droughts of the 1930's to return to the land and to provide work for large numbers of men on relief rolls. Since the cost of developing the water conservation projects is more than the water users can repay over a 40-year period, the costs to be repaid do not include all of the funds contributed by the Work Projects Administration and the Civilian Conservation Corps. Though no new appropriations are proposed for these projects for the fiscal year 1943, expenditures under existing appropriations which carry over will total about \$2,000,000. With this money, it is expected to complete the five Great Plains projects and to continue construction on five additional projects which have been authorized.

Most of the Indian reservations are located on the arid and semiarid lands of the West. The economic welfare of the tribes on these reservations requires an orderly development of the reservation resources. Since agriculture and stock raising are by far the most important industries of the Indians, the development of reservation resources calls primarily for the supply

of irrigation water. The present six-year program of the Bureau of Indian Affairs for irrigation construction calls for the expenditure of \$60,000,000. Of that amount, \$552,250 is proposed to be spent in the fiscal year 1943. The largest expenditures will be made on the Colorado River project in Arizona, the Navajo irrigation projects in Arizona, New Mexico, and Utah, and the Flathead Lake project, Montana.

#### Forests

To facilitate the administration and protection of the National Forests, it is necessary to equip them with various classes of improvements, such as: telephone lines for fire control in localities where commercial systems are not available; lookout facilities for fire spotting purposes and for transmitting fire alarms; dwellings, barns, and other structures necessary to provide quarters for men and animals who must be stationed remote from any settlement or rentable quarters; office structures for housing records and transacting business required in administrative or fire-control work; fences to control stock; water improvements in the form of developed springs and wells, pipe lines, and other works; campground improvements designed to protect the forests; and forest development roads and trails, where the value of the service rendered by the roads is greater for the administration and protection of forest lands than it is for public travel.

For each national forest there has been developed an improvement plan which is periodically reviewed by the regional office staff and coordinated with the plans of neighboring national forests. This plan takes into consideration the multiple-use development of forest areas: Development for timber and forest products; for grazing; for protection of wildlife resources; for recreation; and for general management and operation, including forest fire control, insect and pest control, and road and trail development. Public works are programmed on the basis of the improvement plan.

For the fiscal year 1943 the Forest Service construction program for buildings, structures, and other improvements includes a large number of items, scattered throughout the country, whose individual cost is less than \$7,500. The expenditures on these projects are estimated at \$665,000, representing a reduction in the current construction program due to the deferring of projects because of the war effort.

For forest development roads and trails about \$3,300,000 will be expended in 1943.

#### Parks

A myriad of sundry construction items is required for the development of a park area. Since most national parks are located in remote sections of the country, provision must be made to house and feed

visitors and to supply them with sanitary facilities and other conveniences. Roads and foot and horse trails are necessary in order to render points of special interest readily accessible. Quarters must be provided for the administrative and protective personnel. Fire protection facilities are essential in all areas.

In order to plan properly for the coordinated development of National Parks, the Park Service has prepared a master plan for each park area which shows the ultimate development currently considered necessary for its proper functioning. On the basis of the master plan, the Service then prepares a project construction program, which forms the basis for all construction activity regardless of the source of the funds.

Due to the necessity for reducing expenditures not directly related to the war effort, the physical development program of the National Park Service has been severely curtailed for the fiscal year 1943. For buildings and utilities in all National Parks it is estimated that a total of \$169,600 will be expended during the fiscal year. This sum, to be divided between 12 projects, will be used primarily for water and sewer systems to protect the health of visitors at existing park areas.

The estimated expenditure for construction and improvements of roads and trails in National Parks and Monuments is only \$1,000,000 for the fiscal year 1943. With this money the Service will be able to do little more than liquidate existing contractual obligations, meet minor emergency conditions, and prepare plans and specifications for road improvement projects to be undertaken during the post-war period.

A large part of park development work during the recent years has been prosecuted with the cooperation of the Civilian Conservation Corps and the Work Projects Administration. This cooperation will of necessity be very greatly curtailed during the next fiscal year so that the total expenditures on physical improvements in national parks will be severely curtailed.

#### Soil Conservation

The Soil Conservation Service of the Department of Agriculture administers both research and action programs. The research program provides for investigations into the character, extent, and effect of soil erosion and water depletion and methods for soil and water conservation. This program requires office and laboratory buildings for its conduct. For the next fiscal year the Soil Conservation Service proposes to construct two such buildings, one in Marcellus, N. Y., and one in McCredie, Mo., at a total cost of \$30,000.

The action program involves the conduct of conservation surveys, the execution of soil and moisture conservation operations on demonstration projects, and cooperation with soil conservation districts and other

Federal and State agencies. For this operations program, administrative and service facilities are required. These include garages, repair shops, equipment storage buildings, and office structures. For the fiscal year 1943 the Soil Conservation Service estimates that it will expend \$33,500 on six such projects.

In addition to the research and action programs, the Soil Conservation Service is responsible for administration of Title III of the Bankhead-Jones Farm Tenant Act, which provides for the acquisition and retirement of submarginal land. The land acquired is usually taken out of cultivation and put into grazing, forestry, or associated uses. This necessitates improvement, protection, and supervision of the land. For the fiscal year 1943 the Department of Agriculture contemplates the construction of physical improvements on one land retirement project, namely, the Clovis Project in Curry County, N. Mex. Here it is planned to construct an impounding dam and running water draw projects at an estimated cost of \$40,000.

Reorganization Plan No. 4 transferred responsibility for the conduct of soil and moisture conservation operations on public lands under the jurisdiction of the Department of the Interior from the Department of Agriculture to the Department of the Interior. The Office of Land Utilization of the latter Department is charged with coordinating the program, including the allotment of funds to the following constituent agencies for carrying on the work: Grazing Service, General Land Office, Office of Indian Affairs, Bureau of Reclamation, Geological Survey, National Park Service, Fish and Wildlife Service. For the next fiscal year public work expenditures of \$98,500 are proposed in connection with this program.

#### Range Lands

The Federal range is administered by the Departments of Agriculture and Interior. Where range lands are included within the confines of National Forests, the Forest Service is responsible for their administration. Where they are included within the boundaries of Grazing Districts, established under the Taylor Grazing Act of 1934, the Grazing Service of the Department of the Interior administers them. And where lands are made available for grazing outside of established Grazing Districts, but within previously unreserved public lands, the General Land Office assumes administrative responsibility. In addition, grazing is conducted on certain allotted and unallotted Indian lands.

For the development and protection of all grazing lands, public improvements are required for fire control; water development, including storage reservoirs for surface water and wells and springs for ground water; trails and bridges for trucks and for stock; soil



and moisture conservation; provision of forage, including seeding; fencing; and small building construction, including sheds and warehouses.

For the fiscal year 1943, all improvements to grazing lands in National Forests are estimated to cost less than \$7,500 per project and are reported in lump sum with other forest public works under the section on Forests. It is estimated that the Grazing Service will expend \$100,000 during the fiscal year on the construction of range improvements within Grazing Districts. For construction of range improvements on public lands outside of Grazing Districts, but subject to grazing leases, the General Land Office estimates an expenditure of \$20,000 for the fiscal year 1943. Public improvement expenditures for range lands under the jurisdiction of the Indian Service are reported with the projects for irrigation and reclamation on Indian lands.

#### Wildlife

The Federal Government, through the Fish and Wildlife Service, has assumed responsibility for protecting migratory waterfowl, for safeguarding and protecting the native North American wildlife species, and for the conservation of American and Alaskan fisheries. Each of these activities requires public works improvements.

To provide protection for migratory waterfowl, the Federal Government has established four major migratory waterfowl flyways. The facilities along these flyways consist of nesting sites, resting areas, and sufficient territory within the winter range to provide for the fowl during the months of the year when they are crowded into the smallest quarters.

To provide a Federal refuge for safeguarding seed stock for native North American wildlife species within their natural ranges, big game areas have been established in the West and, more recently, upon land utilization areas in typical woodland habitat of the East and South.

The major emphasis in the construction program for wildlife projects is upon restoring areas providing additional habitat, rather than upon acquisition of new areas which are already productive. The restoration of existing areas calls for the provision of buildings, roads, and fences and for water control development.

Estimates of expenditures for public works at bird refuges and big game preserves during the next fiscal year have been reduced to such an extent, in keeping with the objective of reducing nonwar expenditures, that no significant construction will be initiated during the year.

To conserve American fisheries, the Federal Government has developed a fairly extensive fish hatchery system. The units comprising this system are rather generally distributed over the 48 states. Consequently, the 6-year program of public works for fish cultural

stations does not contemplate any large expansion of this system by construction of new projects. Such projects are recommended only in the case of special needs such as may be expected to develop, for example, in the Olympic National Park. The major portion of the construction work contemplates maintaining existing equipment and facilities at the highest degree of efficiency with a minimum of expansion through the development of entirely new projects. For the fiscal year 1943, it is estimated that expenditures will be made only for repairs and improvements of older hatcheries.

For the conservation of fur seals and other marine mammals in Alaskan waters and for maintaining the natives on the Pribilof Islands, the Federal Government is responsible for the construction, improvement, and repair of buildings, including warehouses, refrigeration facilities, hospitals, and docks; housing facilities; and roads and trails. For the fiscal year 1943 the only public work expenditure estimated for the Alaska fisheries is \$4,700 for a seal-skin blubbering house and for enlargement of the existing seal-skin wash house on St. George Island.

The total estimated public works expenditures for all fish and wildlife projects during the 1943 fiscal year is \$122,000.

#### Promotion of Transportation

##### Highways, Roads and Streets

Responsibility for the construction of highways financed entirely by Federal funds is shared by the Federal Works Agency and the Departments of Agriculture and of the Interior. The Federal-aid highway programs, under the Public Roads Administration, are regarded as activities of construction agencies (Class II). Consequently, estimates for the Federal-aid construction financing for the fiscal year 1943 are contained in Table IV.

The Public Roads Administration, in addition to supervising the Federal-aid highway system, constructs access roads and flight strips for defense purposes and Federal highways through unappropriated and unreserved public lands. The National Defense Highway Act of 1941 authorizes the appropriation of \$150,000,000 for the construction and improvement of access roads to military and naval reservations, defense industries, and the sources of raw materials, when such roads are certified to the Federal Works Administrator by the Secretary of War or the Secretary of the Navy as important to the national defense. This sum is made available, without regard to apportionment among the States, for paying all or any part of the costs of the roads. For the fiscal year 1942, it is estimated \$30,000,000 will be expended on access roads. It is estimated that an additional \$40,000,000 will be required in the fiscal year 1943.



The Defense Highway Act also authorizes the appropriation of \$10,000,000 for the construction of flight strips adjacent to public highways. The money appropriated in pursuance to this authorization is to be spent in cooperation with the Army Air Corps, without regard to apportionment, and for paying all or part of the costs of the landing areas. Of the \$5,000,000 appropriated for flight strips, it is estimated that \$3,000,000 will be spent in 1942 and \$2,000,000 in 1943.

The recommended expenditure of \$500,000 for highways on unappropriated and unreserved public lands is part of a continuing program, subject to the authorizations of the Congress. No estimates are immediately available as to the total cost of a complete development program for public-land highways.

The Department of Agriculture is responsible for the construction of highways in the National Forests. Forest highways are to be distinguished from forest development roads and trails, which are reported in the previous section on Land Development and Protection. Forest highways render service primarily for public travel, whereas forest development roads and trails render primary service for the administration, protection, and development of forest areas. The presently authorized system of forest highways calls for the expenditure of \$129,500,000, of which more than \$113,000,000 has already been spent. For the fiscal year 1943 it is recommended that an additional \$4,869,500 be used for this purpose.

Federal parkways and Federal highways in Alaska are constructed under the supervision of the Department of the Interior. The National Park Service has under construction three National Parkways: The Blue Ridge Parkway, at a total authorized cost of \$41,500,000, the Natchez Trace Parkway, at \$39,600,000 and the George Washington Memorial Parkway, at \$6,750,000. During the next fiscal year it is estimated that \$1,300,000 will be expended on the Blue Ridge Parkway and \$450,000 on the Natchez Trace.

The Alaska Road Commission intends to complete in the next fiscal year the third division of the Palmer-Richardson Highway, which connects the Anchorage road system with the Richardson Highway, 115 miles north of Valdez. This highway, on which an expenditure of \$400,000 is contemplated for 1943, is considered necessary for national defense as well as for general communication purposes.

#### River and Harbor Development

The program proposed by the Corps of Engineers of the War Department for the improvement of existing river and harbor works in the fiscal year 1943 has been limited to projects essential to the movement of naval craft, projects necessary to accommodate the water transportation of defense materials, and projects re-

quired to protect or make readily available the large benefits of existing improvements and those currently under construction. The deepening of Ambrose Channel in New York Harbor and the completion of the breakwaters at Los Angeles and Long Beach harbors and at Neah Bay, Wash., are all considered essential to the movement of naval craft. Of the projects necessary to accommodate the transportation of defense materials, three, totaling over \$6,000,000 in expenditures in 1943, will provide facilities for the large-scale movement of petroleum products.

For certain projects where the Federal investment is very large, it has also been found necessary to construct protective works to prevent serious injury to the existing improvements. Thus, for example, bank protective measures are to be undertaken on the Missouri River between Kansas City and Sioux City and a new Lock No. 2 is to be completed on the Mississippi River about 35 miles below Minneapolis in order to assure continuing movement of river traffic to and from Minneapolis and St. Paul.

The deferment of projects not considered of great value to the war effort should provide the Corps of Engineers with a shelf of construction that may be initiated in the post-war period. The total estimated cost of presently authorized projects which have been deferred is about \$100,000,000.

#### Canals

For the enlargement of the capacity of the Panama Canal, the War Department expects to spend \$50,000,000 during the next fiscal year on continuing construction of the third set of locks. The total estimated cost of the locks is about \$277,000,000, and about \$192,000,000 will be required in future years to complete the project.

For special protective works at the Canal, \$10,000,000 will be spent in 1943. The improvement and replacement of quarters, hospitals, schools, warehouses, and other facilities in the Canal Zone are estimated to require the expenditure of \$2,000,000 next year.

#### Aids and Assistance to Navigation

The construction, improvement, and maintenance of lifeboat and light stations, of shore facilities, and of other aids to navigation are a responsibility of the Coast Guard, which was transferred on November 1, 1941, for the duration of the war, from the jurisdiction of the Treasury Department to that of the Navy Department.

For the fiscal year 1943 the Coast Guard expects to expend almost six million dollars on the construction of new facilities and the rebuilding and modernization of existing\* facilities. The largest lifeboat station

projects scheduled for construction in the coming year are those at Miami Beach, Fla., Ocean City, Md., Shark River, N. J., and Rehoboth Beach, Del., all on the Atlantic Seaboard, and at Willapa Bay, Wash., on the Pacific Coast. The Delaware Bay Servicing Base, the Sand Island Depot, at Honolulu, the Mobile, Alabama Repair Station, and the Astoria, Oregon Repair Base, are large construction projects to provide additional shore facilities. Important new light stations are to be erected at various points on the West Coast and the Great Lakes.

#### Airports and Airways

The Federal program for public improvements in the field of civil air transportation is comprised of two parts: The establishment and construction of new Federal airways and additional facilities on existing airways, and the development of landing areas for defense purposes.

The construction program for new Federal airways and for relocation and improvement of entire sections of existing airways contemplates the expenditure of \$1,459,000 in the fiscal year 1943. Large sums are required for the construction of the Houston-Memphis, Knoxville-Norfolk, Pittsburgh-Birmingham, and Atlanta-Cincinnati airways. The programming of new Federal airways is very closely related to the action of the Civil Aeronautics Board in issuing certificates of convenience and necessity.

The installation of ultra-high frequency facilities along existing airways accounts for more than \$3,000,000 of the 1943 estimated expenditures on the Federal airways system. Radio ranges and localizers with outer and inner markers, fan markers, and transmitters and receivers for airport approach and traffic control are the ultra-high frequency facilities to be installed. The Civil Aeronautics Administration also proposes to install airport radio landing systems at ten additional airports during the fiscal year at a total cost of \$800,000.

In October 1940, in accord with an airport development program prepared by the Administrator of Civil Aeronautics, the Congress authorized the construction of 250 public airports and landing areas necessary for national defense. Since that time subsequent appropriations have progressively increased the number to be constructed, so that at present 504 ports have been authorized at a total cost of \$189,977,600. No new appropriations are proposed for the development of landing areas in the fiscal year 1943. The estimated expenditures under existing appropriations will total \$44,115,000. To fully develop the 504 landing areas for all-time civil operations, the Civil Aeronautics Administration has estimated that a total of \$242,000,000 would be required, an increase of about \$52,000,000 above the current appropriations.

#### Railroads

The Alaska Railroad is owned and operated by the Federal Government. The expenses for maintaining and improving the property are met through expenditure of the earnings of the road and through additional funds appropriated when necessary to finance any deficiency. The improvement program of the railroad for fiscal year 1943 recommends expenditures of almost \$200,000 for improvement and protection of the road-bed and expenditures of more than \$150,000 for the replacement of wooden bridges with steel structures. In addition, small amounts are included for dormitory and depot structures and for marine ways at Nenana. Construction projects at the hotel operated by the railroad at Mount McKinley Park have been deferred.

#### Miscellaneous

The U. S. Maritime Commission maintains the U. S. Maritime Service as a voluntary organization for the training of citizens to serve as licensed and unlicensed personnel on American merchant vessels. To provide physical facilities for this purpose, the Commission operates six training stations, four on the Atlantic coast and two in California. For buildings and structures at these training stations, an estimated expenditure of \$1,550,000 will be required in 1943.

#### Power<sup>3</sup>

The estimated requirements for electric energy for the war program in future years will, it now appears, exceed by far all presently available capacity. However, to meet estimated deficiencies, the Federal Power Commission in July 1941 recommended the installation of additional steam and hydroelectric facilities to supply 13,680,000 kw. of dependable capacity by 1946.

Year to be completed:	Additional dependable capacity recommended in FPC report, July 16, 1941 (kw.)
1943.....	2,339,000
1944.....	3,666,000
1945.....	3,958,000
1946.....	3,717,000

Of this capacity approximately 8.5 million kw. would be supplied by the installation of steam-electric projects. These projects would be undertaken for the most part by private utilities and municipalities. The remaining 5.2 million kw. would be supplied by hydroelectric installations, of which only 300,000 kw. would be assigned to private utilities and municipalities. Federal construction, by the Corps of Engineers, the Bureau of Reclamation, and the Tennessee Valley Authority, would account for almost 4.9 million kw. of dependable power.

<sup>3</sup> Multiple-purpose flood-control and irrigation projects, which have important power aspects, have already been discussed under the previous section on Land Development and Protection.

The program of power development now being undertaken by the Tennessee Valley Authority consists of work at 19 major dam and reservoir projects and two steam plants of the Authority's unified system. Since the time the Authority's program was accelerated in July 1940, to meet national defense needs, a total of 1,430,900 kw. of additional generating capacity has been scheduled. This capacity is to become available during the 1942, 1943, and 1944 calendar years. These additional installations will consist of increases in capacity at existing dams and steam plants, and generating facilities at new dams and steam plants under construction by the Authority or scheduled for construction during the fiscal year 1943. Funds in excess of \$143,000,000 are provided for this program during the fiscal year 1943.

In the following table are listed the additional installed capacities authorized for dams and steam plants of the Authority since July 1940:

Project:	Installed capacity authorized since July 1940 (kilowatts)
Kentucky Dam and Reservoir.....	32, 000
Pickwick Landing Dam and Reservoir.....	72, 000
Wilson Dam and Reservoir.....	151, 200
Wheeler Dam and Reservoir.....	64, 800
Guntersville Dam and Reservoir.....	24, 300
Chickamauga Dam and Reservoir.....	27, 000
Watts Bar Dam and Reservoir.....	60, 000
Fort Loudoun Dam and Reservoir.....	128, 000
Hiwassee Dam and Reservoir.....	57, 600
Apalachia Dam and Reservoir.....	75, 000
Chatuge Dam and Reservoir.....	Storage
Notteley Dam and Reservoir.....	Storage
Ocoee No. 3 Dam and Reservoir.....	24, 000
Watts Bar Steam Plant.....	240, 000
Fontana Dam and Reservoir.....	200, 000
S. Fork of Holston Dam and Reservoir.....	75, 000
Watauga Dam and Reservoir.....	60, 000
Sheffield Steam Plant.....	50, 000
Cherokee Dam and Reservoir.....	90, 000
Total.....	1, 430, 900

This large program of power development in the Tennessee Valley represents an acceleration of the normal long-term program for the unified system development of the Tennessee River.

The Bonneville Power Administration distributes the power generated at the Grand Coulee<sup>4</sup> and the Bonneville Dams. The long-range program of the Administration looks toward the ultimate interconnection of all the Government's major power projects in the Pacific Northwest. This program has been greatly accelerated for the fiscal years 1942 to 1944 due to the defense program. With an estimated installed capacity of 1,166,400 kw. by December 1943 and 1,490,400 kw. by May 1944 at the two dams, the construction of the

<sup>4</sup> The power plant installations at Grand Coulee are made by the Bureau of Reclamation and estimates of expenditures for these appear under the heading "Irrigation and Reclamation" in Table I.

transmission lines, substations, and feeder connections necessary to deliver this power to the new defense-industrial plants throughout the region must be greatly accelerated. Whereas expenditures for transmission and related facilities totaled only \$16,000,000 in the fiscal year 1941, they are estimated to reach \$34,000,000 in 1942 and \$33,000,000 in 1943.

The installations at Bonneville are under construction by the Corps of Engineers, with an estimated expenditure of \$4,000,000 in the 1943 fiscal year.

## Welfare and Health

### Public Water Supply, Sanitation, and Sewer Systems

Public water supply and sanitation features are prominent in several multiple-purpose water projects which have been reported under the previous sections on Flood Control and on Irrigation and Reclamation. For example, the Berlin Reservoir is designed to insure industrial water supplies at Youngstown, Ohio. Many flood control reservoirs, by regulating stream flow, assist in pollution abatement. The Lugert-Altus reclamation project will furnish the domestic water supply for Altus, Okla. Also, in many instances, Indian reservations are provided with domestic water supplies from the irrigation projects developed on their lands.

The only water supply and sanitation project reported under this title in the Table is the Douglas Sanitation project, under the jurisdiction of the International Boundary Commission, United States and Mexico. Douglas, Ariz., a town of some 8,000 population, has been for years discharging the effluent from its sewerage across the boundary line into Mexico, seriously affecting the health problem in the town of Agua Prieta, Sonora. The sanitation project has been designed cooperatively by the United States and Mexico.

### Welfare and Health Facilities

Welfare and health facilities in the form of physical structures are provided by the Federal Government for Veterans, Indians, American merchant seamen, members of the armed forces, and certain special small groups.

The Veterans' Administration supplies hospital and domiciliary care for veterans of all wars. Veterans Facilities, which are located in 47 States and the District of Columbia, may be designed to provide facilities for general medical care, diagnosis, neuropsychiatric care, the treatment of tuberculosis, or for domiciliary or home activities. Under the 1943 construction program of the Administration, 500 additional general medical beds and 367 additional domiciliary beds will be provided by the construction of a new Veterans Facility in the Pennsylvania area and by additions to the facilities at Dearborn, Mich. and Marion, Ill. In

addition, major reconditioning and new construction at existing facilities, not providing additional beds, will cost an estimated \$1,595,000 in 1943.

The administration of Indian lands and proper care for the health and welfare of American Indians necessitates the construction by the Federal Government of physical improvements such as hospitals, day schools, quarters for personnel, heating and power plants, and sewer and water systems. Practically no direct appropriations were made for this type of construction work in the Indian Service for the period from 1932 to 1937. The needs during those years were met through allotments made by the Public Works Administration. Since that time, however, expenditures for physical improvements, excluding irrigation systems and roads, have averaged about \$2,500,000 a year. During the fiscal year 1943 it is anticipated that expenditures will total \$1,750,000. The projects scheduled for construction include employees' quarters, classrooms, and a unit of the sanitorium at Tacoma, Washington.

In addition to the physical improvements mentioned, the proper administration and protection of Indian lands requires the construction of roads, trails, and bridges. The Bureau of Indian Affairs estimates an expenditure during the fiscal year 1943 of about \$1,500,000 on roads and bridges at various locations within Indian reservations. It will cost \$6,250,000 after 1943 to complete the presently authorized Indian road improvement program. However, it should be noted that the authorization does not represent the cost of all roads and bridges at present required by the Indian Service.

Marine hospitals are constructed for the use of American merchant seamen and other groups by the Public Buildings Administration for the United States Public Health Service. No new construction is proposed for 1943.

For the treatment of mentally ill members of the military service and for certain civilians, the Federal Government maintains St. Elizabeths Hospital in Washington. For the completion of continuous treatment buildings, \$300,000 will be expended in 1943.

#### **Penal and Correctional Institutions**

The Bureau of Prisons at present maintains six penitentiaries, six reformatories, nine correctional institutions, and five camps for the detention and care of Federal prisoners. Although the 6-year construction program of the Bureau provides for additional facilities at existing institutions and for new institutions, the program for 1943 is limited to extensions to facilities at eleven existing institutions. All of the projects are quite small, with the exception of McNeil Island, where it is proposed to expend \$80,000 on additions to, and development of, the island area.

### **Government Administration**

#### **Public Buildings**

The construction of public buildings is a service function for the administration of government programs. For the legislative branch, the only expenditure proposed for building construction in the 1943 fiscal year is that of \$489,000 for continuation of the reconstruction of the roofs on the House and Senate wings of the Capitol.

The expenditures for the construction of public buildings outside of the District of Columbia will be greatly curtailed during the next fiscal year. It is not proposed to initiate construction on any new units. The \$4,500,000 to be expended will be used to liquidate current obligations and to complete construction on going projects.

The influx of Government workers due to the war program has created a very serious office space shortage within the District of Columbia. The Public Buildings Administration is attempting to solve the problem by constructing temporary buildings and general utility buildings of a more permanent nature, by continuing its regular construction program, and by renting all available private office-building space. For the fiscal year 1943, the total expenditure for public buildings in and around Washington will be about \$25,500,000. Nearly half of this sum will be spent to complete the new \$31,000,000 War Department building in nearby Arlington County, Va. Of the remainder, \$5,000,000 will be used for continuing construction on the General Accounting Office building, and \$9,000,000 will be spent on the construction of temporary and semipermanent buildings to meet the immediate and urgent needs.

The Foreign Service Buildings Office of the State Department is responsible for providing buildings for the use of the diplomatic and consular establishments of the United States. With the exception of \$50,000 for completion of the actual construction of the legation and office building at Canberra, Australia, all expenditures will be made in South and Central America. It is proposed to initiate construction on one new project, a Secretary's residence at Managua, and to purchase the site for a Secretary's residence at Ciudad Trujillo. All other expenditures will be made on improvements to existing facilities and on continuation of construction on projects now under way.

#### **Research Facilities**

Of the estimated \$13,800,000 expenditure in 1943 for research facilities for the Federal Government, \$12,500,000 applies to the National Advisory Committee for Aeronautics. The National Advisory Committee for Aeronautics is now concentrating all of its efforts on confidential researches for the Army and

Navy. These researches require several types of wind tunnels in which the characteristics of different aircraft models may be tested under varying conditions. In addition to the existing research laboratory at Langley Field, Va., the Committee has under construction large units at Moffet Field, Calif., and at Cleveland, Ohio.

The widespread research activities of the Department of Agriculture require the construction of special facilities. Among the largest research units of the Department are the Beltsville, Md., Research Center at which nine bureaus conduct scientific, experimental, and research work; the four regional research laboratories authorized by Congress in 1938 for research into the industrial utilization of agricultural products—the northern area laboratory at Peoria, Ill., the southern area laboratory at New Orleans, La., the eastern laboratory near Philadelphia, and the western laboratory near San Francisco; and the Forest Products Laboratory at Madison, Wis. During the fiscal year 1943, \$800,000 is to be spent on completing the removal of the Arlington Farms laboratories of the Bureau of Plant Industry from Arlington, Va., to the Beltsville Center. The completion of certain units at the four regional laboratories will require the expenditure of \$47,000 in 1943. In addition, small sums will be spent on additions to, and improvements of, the existing facilities at many of the Department's research units.

In order to conduct investigations of the Nation's water resources and in order to develop satisfactory hydrologic data, the Geological Survey must construct and maintain gaging stations on streams in most drainage basins. For this purpose \$65,000 will be spent in 1943.

To develop and test new processes for producing various strategic metals, the Bureau of Mines operates several laboratories and pilot plants. The need for manganese in the war program has necessitated the construction of beneficiation pilot plants for that mineral. In 1943, \$163,000 will be expended for this purpose.

#### Law Enforcement

To prevent losses of cattle and to aid in the enforcement of immigration and customs laws, the International Boundary Commission is constructing a fence along parts of the international boundary in New Mexico, Arizona, and California. The total estimated cost of the project is \$580,000. Certain sections of the fence have been built along the boundary in Arizona, and it will cost \$505,000 to complete the project after the 1943 fiscal year.

#### Housing

In the fall of 1940 the Federal Government assumed responsibility for meeting the acute housing shortages

which were developing for defense workers, families of enlisted men and civilian personnel of the Army and Navy, and civilian employees of the Maritime Commission. A public housing program was organized, providing for both temporary and permanent shelter. The Federal Housing Act was also amended so as to allow more liberal insurance arrangements for private builders.<sup>5</sup>

Since 1940, the defense housing program has grown tremendously. By the end of the 1943 fiscal year it is estimated that the Federal Works Agency alone will have constructed some 150,000 permanent and semi-permanent dwelling units at a total cost of about \$640,000,000. In cases of urgent and immediate need, where the situation will not wait for the construction of housing under the regular defense housing program, temporary shelter in the form of trailers, dormitories, and portable houses has been provided. During 1943, \$144,500,000 will be expended on dormitories and portable houses and will complete the presently authorized program of \$316,000,000.

#### Miscellaneous

##### District of Columbia

An expenditure of \$8,587,000 is recommended for general public works construction in the District of Columbia during the fiscal year 1943. These works will be constructed under the administration of the District Government and will be financed partly by a contribution from the Federal Government to the funds of the District. The projects comprise all types of public works construction necessary for a modern city government and include streets, schools, water and sewer systems, government buildings, etc.

##### Community Facilities

The Division of Defense Public Works of the Federal Works Agency under the authority of Title II of the Lanham Act is enabled both to make grants and loans to State and local governments for the construction of defense-connected public works and to build such works for Federal ownership with appropriate lease arrangements with State and local authorities for their use. Of the \$300,000,000 so far appropriated for this purpose, it is estimated that about \$126,000,000 will be used for the construction of community facilities by the Federal Government, such facilities then to be leased to State and local authorities.<sup>6</sup>

It is estimated that \$54,600,000 of the \$126,000,000 for Federal construction will be expended in the fiscal year 1942 and \$71,400,000 in the fiscal year 1943.

<sup>5</sup> Estimates of the housing construction to be financed in 1943 by the Federal Housing Administration, a construction agency (Class II), are contained in Table IV, as are estimates of defense housing to be financed by the Reconstruction Finance Corporation.

<sup>6</sup> The balance of \$174,000,000 will be used for grants and loans and estimates covering this financing for the fiscal year 1943 are contained in Table IV.



## FEDERAL SIX-YEAR PROGRAM OF PUBLIC WORKS

TABLE I.—Projects recommended for fiscal year 1943

Docket No.	Name and location of project	Total estimated cost	Estimated expenditure to June 30, 1942	Recommended expenditure for fiscal year 1943	Additional expenditure required thereafter to complete
<b>NATIONAL DEFENSE<sup>1</sup></b>					
<b>Military Facilities:</b>					
-----	Army camps, cantonments, bases, air fields, barracks, armories, seacoast defenses, hospitals, storage facilities, etc.	\$1,400,000,000	-----	\$1,400,000,000	-----
<b>Naval Facilities:</b>					
-----	Naval yards, docks, bases, air stations, hospitals, storage facilities, training stations, etc.	500,000,000	-----	500,000,000	-----
<b>Production Facilities:</b>					
-----	Army and Navy ordnance plants, ship-building and repair facilities, Lend-Lease production facilities, etc.	2,700,000,000	-----	2,700,000,000	-----
Total, National Defense		4,600,000,000	-----	4,600,000,000	-----
<b>LAND DEVELOPMENT AND PROTECTION</b>					
<b>Flood Control:</b>					
<b>Corps of Engineers:</b>					
<b>Flood control projects, general:</b>					
302-9-27	Whitney Point Reservoir, N. Y.	4,332,000	\$4,074,000	258,000	-----
302-2-2	Franklin Falls Reservoir, Merrimack River Basin, N. H.	7,883,000	7,460,000	423,000	-----
302-5-11	Birch Hill Reservoir, Connecticut River Basin, Mass.	3,720,000	3,615,000	105,000	-----
302-5-18	Chilcopee, Connecticut River Basin, Mass.	1,592,000	1,422,000	170,000	-----
302-5-14	Hartford, Connecticut River Basin, Conn.	5,485,000	5,040,000	193,000	\$252,000
302-5-13	Knightville Reservoir, Connecticut River Basin, Mass.	3,160,000	3,050,000	110,000	-----
302-5-9	Surry Mountain Reservoir, Connecticut River Basin, N. H.	1,620,000	1,595,000	25,000	-----
302-9-38	Avoca, N. Y.	454,000	444,100	9,900	-----
302-9-30	Binghamton, N. Y.	2,947,000	2,029,400	917,600	-----
302-9-32	Corning, N. Y.	1,775,000	1,567,000	208,000	-----
302-9-31	Elmira, N. Y.	3,075,000	1,089,800	800,000	1,185,200
302-9-28	Liste, N. Y.	369,300	334,300	35,000	-----
302-9-35	Painted Post, N. Y.	420,500	411,500	9,000	-----
302-9-14	Plymouth, Pa.	1,089,000	931,000	158,000	-----
302-9-36	Williamsport, Pa.	5,426,500	1,232,900	500,000	3,693,600
302-9-37	York, Pa.	4,115,000	3,547,000	568,000	-----
302-87-4	Wallace Lake, La.	1,094,000	694,000	400,000	-----
302-90-28	Natchitoches Parish, La.	1,069,100	932,000	137,100	-----
302-89-2	Memphis, Wolf River, and Nonconah Creek, Tenn.	9,000,000	5,555,300	300,000	3,144,700
302-95-1	Buffalo Bayou, Tex.	18,751,700	1,540,000	1,500,000	15,711,700
302-85-1	Denison Reservoir, Tex.	48,290,000	21,588,300	11,000,000	15,701,700
302-78-1	John Martin Reservoir, Colo.	14,200,000	10,709,300	3,000,000	497,000
302-78-4	Blue Mountain Reservoir, Arkansas River Basin, Ark.	3,700,000	2,903,400	600,000	196,600
302-84-5	Nimrod Reservoir, Arkansas River Basin, Ark.	3,500,000	3,466,000	34,000	-----
302-82-4	Norfolk Reservoir, White River Basin, Ark.	27,500,000	10,184,400	11,000,000	6,315,600
302-78-3	Canton Reservoir, Arkansas River Basin, Okla.	13,870,000	2,854,000	2,800,000	8,216,000
302-81-2	Fort Supply Reservoir, North Canadian River, Okla.	8,000,000	7,959,500	40,500	-----
302-90-7	Clear Creek Drainage and Levee District, Ill.	943,000	468,000	200,000	275,000
302-65-1	East St. Louis and vicinity, Ill.	1,158,000	1,134,900	23,100	-----
302-73-3	Kanopolis Reservoir, Missouri River Basin, Kans.	8,977,000	5,275,000	3,000,000	702,000
302-77-4	Kansas Cities on Missouri and Kansas Rivers, Mo. and Kans.	10,000,000	3,787,100	650,000	5,562,900
302-32-3	Wolf Creek Reservoir, Ohio River Basin, Cumberland River, Ky.	35,000,000	6,033,300	16,500,000	12,466,700
302-43-4	Evansville, Ind.	3,628,000	2,791,000	400,000	437,000
302-43-9	Jeffersonville-Clarksville, Ind.	2,984,300	2,895,000	89,300	-----
302-42-14	Levee Unit No. 8, West Fork of White River, Ind.	350,000	334,400	15,600	-----
302-43-13	Mounds and Mound City, Ill.	2,184,000	1,722,500	461,500	-----
302-43-7	Paducah, Ky.	3,534,000	3,395,000	139,000	-----
302-38-1	Cincinnati, Ohio	6,530,000	2,442,000	3,512,000	576,000
302-37-3	Portsmouth-New Boston, Ohio	5,238,000	3,063,000	750,000	1,425,000
302-36-2	Massillon, Ohio	3,895,000	2,959,000	495,000	441,000
302-35-4	Parkersburg, W. Va.	3,411,000	1,847,200	300,000	1,263,800
302-33-16	Johnstown Channel, Pa.	8,670,000	7,612,000	1,058,000	-----
302-33-11	Loyalhanna Creek Reservoir, Pa.	5,700,000	5,047,000	653,000	-----
302-33-10	Mahoning Creek Reservoir, Pa.	6,500,000	6,379,000	121,000	-----
302-33-7	Youghiogheny River Reservoir, Ohio River Basin, Pa.	9,000,000	4,798,000	3,000,000	1,202,000
302-108-1	Los Angeles River Channel, Calif.	44,032,500	36,077,300	3,000,000	4,955,200
302-108-7	Santo Fe Dam, San Gabriel River Basin, Calif.	11,575,300	5,074,100	3,000,000	3,501,200
302-108-19	Sepulveda Dam, Los Angeles River Basin, Calif.	7,210,600	6,729,800	880,800	-----
302-113-15	Multnomah Drainage District No. 1, Multnomah County, Ore.	563,800	548,800	15,000	-----
302-113-16	Peninsula Drainage District No. 2 Multnomah County, Ore.	256,500	241,500	15,000	-----
302-113-17	Sauvie Island (Areas A and B), Multnomah County, Ore.	1,540,000	1,350,000	190,000	-----
302-113-18	Scappoose Drainage District, Columbia County, Ore.	456,000	424,000	32,000	-----
302-113-14	Diking and Improvement District No. 4, Wahklakum County, Wash.	128,200	85,400	42,800	-----

<sup>1</sup> For reasons of national security, no detailed estimates are presented covering the total estimated cost, the expenditure prior to June 30, 1942, or the expenditures after fiscal year 1943 to complete those projects recommended for construction in 1943. Thus, the total estimated cost is the same as the recommended expenditure for 1943.



TABLE I.—Projects recommended for fiscal year 1943—Continued

Docket No.	Name and location of project	Total estimated cost	Estimated expenditure to June 30, 1942	Recommended expenditure for fiscal year 1943	Additional expenditure required thereafter to complete
<b>LAND DEVELOPMENT AND PROTECTION—Continued</b>					
<b>Flood Control—Continued.</b>					
<b>Corps of Engineers—Continued.</b>					
<b>Flood control projects, general—Continued.</b>					
302-114-1.....	Mud Mountain Dam, White River, Wash.....	\$11,200,000	\$11,000,000	\$200,000	-----
302-82-3.....	Clearwater Reservoir, White River Basin, Mo.....	8,500,000	4,585,300	2,100,000	\$1,814,700
302-83-21.....	Fort Gibson Reservoir, Arkansas River Basin, Okla.....	16,700,000	2,335,000	6,815,000	7,550,000
302-83-22.....	Markham Ferry Reservoir, Arkansas River Basin, Okla.....	\$14,618,000	1,500,000	8,410,000	\$4,708,000
302-84-7.....	Tulsa and West Tulsa, Okla.....	513,000	300,000	213,000	-----
302-40-1.....	Newport, Ky.....	2,262,000	527,000	1,735,000	-----
302-35-1.....	Bluestone Reservoir, Ohio River Basin, W. Va.....	21,814,000	4,797,700	11,700,000	5,316,300
302-26-9.....	Prattville, Autauga Creek, Ala.....	530,000	200,000	330,000	-----
302-26-10.....	Allatoona Reservoir, Coosa River Basin, Ga.....	\$13,000,000	3,000,000	\$10,000,000	-----
-----	Center Hill Reservoir, Ohio River Basin, Tenn. and Ky.....	23,100,000	2,000,000	8,900,000	12,200,000
-----	Dale Hollow Reservoir, Ohio River Basin, Tenn. and Ky.....	13,000,000	2,000,000	7,450,000	3,550,000
302-34-2.....	Berlin Reservoir, Ohio River Basin, Ohio.....	6,600,000	2,485,000	4,115,000	-----
<b>Flood control projects, Mississippi River:</b>					
302-89-1.....	Mississippi River flood control in the Alluvial Valley, Ill., Ky., Mo., Tenn., Ark., Miss., and La.....	662,982,000	442,153,424	30,000,000	190,828,576
<b>Flood control projects, Sacramento River, Calif.:</b>					
-----	Dredging channel, building levees, bank protection, etc.....	30,750,000	20,100,000	1,000,000	9,650,000
<b>Department of Agriculture:</b>					
<b>Construction costs for improvement works for run-off and waterflow retardation measures and soil erosion prevention on watersheds of flood control projects:</b>					
809-108-1.....	Los Angeles, Calif.....	{ \$2,500,000	500,000	225,000	1,775,000
-----	-----	{ \$8,379,635	1,127,880	1,218,861	6,032,894
<b>International Boundary Commission, U. S. and Mexico:</b>					
104-41-2.....	Lower Rio Grande flood control project, along Rio Grande from Penitas, Texas, to the Gulf.....	9,390,000	7,861,500	1,000,000	528,500
104-41-3.....	Rio Grande canalization project, along the Rio Grande from El Paso, Texas, to Caballo Dam in New Mexico.....	4,000,000	3,770,000	230,000	-----
<b>Total, Flood Control.....</b>		<b>1,221,362,300</b>	<b>727,458,424</b>	<b>168,267,200</b>	<b>325,636,676</b>
<b>Irrigation and Reclamation:</b>					
<b>Bureau of Reclamation:</b>					
<b>Reclamation projects, payable from reclamation fund and general fund:</b>					
702-105-1.....	Klamath Project, Modoc Unit, Calif.-Oreg.....	884,000	587,000	100,000	197,000
702-110-2.....	Boise Project, Payette Division, Idaho.....	8,888,000	5,499,000	500,000	2,889,000
702-112-1.....	Deschutes Project, Oreg.....	6,400,000	1,942,000	600,000	3,858,000
702-110-4.....	Owyhee Project, Oreg.....	18,700,000	18,292,000	115,000	293,000
-----	Hyrum Project, Utah.....	940,000	924,000	4,000	12,000
702-72-1.....	Kendrick Project, Wyo.....	20,000,000	18,436,000	200,000	1,364,000
702-67-4.....	Riverton Project, Wyo.....	9,466,000	6,246,000	75,000	3,145,000
702-67-3.....	Shoshone Project, Heart Mountain Division, Wyo.....	6,500,000	4,525,000	100,000	1,875,000
702-67-5.....	Shoshone Project, Willwood Division, Wyo.....	1,171,000	1,080,000	20,000	71,000
702-103-7.....	Gila Project, Ariz.....	20,500,000	6,915,000	650,000	12,935,000
702-103-6.....	Parker Dam Power Project, Ariz.-Calif.....	16,625,000	12,769,000	2,000,000	1,856,000
702-103-2.....	Davis Dam Project (Bullshead), Ariz.-Nev.....	41,200,000	2,500,000	4,000,000	34,700,000
702-106-1.....	Central Valley Project, Calif.....	264,990,000	105,128,000	45,000,000	114,862,000
702-102-1.....	Colorado-Big Thompson Project, Colo.....	54,918,000	11,319,000	4,625,000	38,974,000
702-110-1.....	Boise Project, Arrowrock Division, Idaho (Anderson Ranch Dam).....	13,040,000	2,737,000	2,000,000	8,303,000
-----	Boise Project, Arrowrock Division, Idaho (drainage).....	160,000	83,000	60,000	17,000
702-66-2.....	Fort Peck Power Project, Mont.-N. Dak.....	6,839,000	-----	400,000	6,439,000
702-81-1.....	Tucumcari Project, N. Mex.....	8,155,000	2,968,000	600,000	4,587,000
702-85-1.....	Lugert-Altus Project, Okla.....	5,600,000	1,486,000	\$290,000	3,824,000
702-104-1.....	Provo River Project, Utah.....	16,202,000	7,960,000	1,500,000	6,742,000
702-110-3.....	Minidoka Project, Idaho.....	625,000	577,000	20,000	28,000
702-100-1.....	Carlsbad Project, N. Mex.....	2,500,000	2,447,000	40,000	13,000
702-104-3.....	Ogden River Project, Utah.....	4,400,000	4,341,000	40,000	19,000
702-111-2.....	Grand Coulee Dam Project, Wash.....	436,344,000	159,724,000	18,000,000	258,620,000
702-111-1.....	Yakima Project, Roza Division, Wash.....	18,085,000	12,082,000	435,000	5,568,000
702-97-1.....	Colorado River Project (Marshall Ford Dam), Tex.....	23,780,000	23,334,000	300,000	146,000
<b>Advances to Colorado River Dam fund:</b>					
702-103-5.....	Boulder Canyon Project, Ariz.-Nev.....	148,000,000	135,094,000	6,000,000	6,906,000
702-103-1.....	All-American Canal Project, Calif.....	65,000,000	33,315,000	1,400,000	30,285,000
<b>Great Plains projects:<sup>1</sup></b>					
702-67-1.....	First Division, Buffalo Rapids Project, Mont.....	330,000	246,000	84,000	-----

<sup>1</sup> Includes additional authorization of \$4,218,000 required to complete.<sup>2</sup> Includes additional authorization of \$10,000,000 required to complete.<sup>3</sup> Construction costs for improvement works only.<sup>4</sup> Estimated total costs of flood control in the watersheds. These amounts are not included in the totals of the table.<sup>5</sup> \$180,500 to be provided from Flood Control, general, War Department.<sup>7</sup> Department of Agriculture costs not included.

TABLE I.—Projects recommended for fiscal year 1943—Continued

Docket No.	Name and location of project	Total estimated cost	Estimated expenditure to June 30, 1942	Recommended expenditure for fiscal year 1943	Additional expenditure required thereafter to complete
<b>LAND DEVELOPMENT AND PROTECTION—Continued</b>					
<b>Irrigation and Reclamation—Continued.</b>					
<b>Bureau of Reclamation—Continued.</b>					
<b>Great Plains projects—Continued.</b>					
702-67-2-----	Second Division, Buffalo Rapids Project, Mont.....	\$740,000	\$530,472	\$200,528	-----
702-70-1-----	Mirage Flats Project, Nebr.....	985,000	717,940	267,060	-----
702-68-2-----	Buford-Trenton Project, N. Dak.....	630,000	536,437	93,563	-----
702-102-7-----	Eden Project, Wyo.....	1,300,000	600,958	699,042	-----
<b>Water conservation and utilization projects:*</b>					
702-102-9-----	Mancos Project, Colo.....	600,000	328,000	170,000	\$102,000
702-69-1-----	Angostura Project, S. Dak.....	1,450,000	112,000	138,000	1,200,000
702-69-2-----	Rapid Valley Project, S. Dak.....	1,100,000	307,000	291,000	502,000
702-104-2-----	Newton Project, Utah.....	215,000	197,000	16,000	2,000
702-110-8-----	Mann Creek Project, Idaho.....	430,000	215,000	212,000	3,000
<b>Bureau of Indian Affairs:</b>					
<b>Construction, repairs, and rehabilitation of irrigation systems on Indian reservations:</b>					
706-8-1-----	Colorado River, Ariz.....	19,552,616	6,236,616	166,000	13,150,000
706-35-1-----	Navajo—Irrigation, Ariz., N. Mex., and Utah.....	6,332,374	2,894,564	85,000	3,352,810
706-43-4-----	Salt River Reservation, Ariz.....	1,587,294	1,173,126	15,000	399,168
706-34-1-----	Mission Agency, Calif.....	860,851	744,351	5,000	111,500
706-52-2-----	Sacramento Agency, Calif.....	708,330	291,230	15,000	402,100
706-2-6-----	Gwens Valley, Calif.....	261,381	246,351	5,000	10,000
706-11-1-----	Pine River, Colo.....	2,211,637	486,837	10,000	1,714,800
706-20-1-----	Fort Hall, Idaho.....	2,545,992	2,163,112	10,000	372,880
706-1-1-----	Blackfeet, Mont.....	4,033,274	1,362,134	25,000	2,646,140
706-16-1-----	Fiathead Lake, Mont.....	10,036,238	9,636,238	85,000	315,000
706-18-1-----	Fort Belknap, Mont.....	867,608	438,108	6,250	423,250
706-21-1-----	Fort Peck, Mont.....	4,094,632	1,366,732	10,000	2,717,900
706-2-3-----	Carson Jurisdiction, Nev.....	213,933	60,433	25,000	128,500
706-2-1-----	Pyramid Lake, Nev.....	505,855	469,855	17,000	19,000
706-2-2-----	Walker River, Nev.....	426,229	386,720	3,000	36,500
706-77-1-----	Western Shoshone, Nev., Utah, and Idaho.....	1,188,702	725,772	5,000	457,930
706-74-1-----	Miscellaneous Pueblos—Irrigation, N. Mex.....	4,661,431	3,462,431	15,000	1,184,000
706-0-1-----	Miscellaneous Garden Tracts, various States.....	1,141,656	696,656	50,000	395,000
<b>Total, Irrigation and Reclamation.....</b>		<b>1,288,922,033</b>	<b>618,951,112</b>	<b>91,797,443</b>	<b>578,173,478</b>
<b>Forests:</b>					
<b>Forest Service:</b>					
(9)-----	Construction of buildings, structures, and other improvements for the administration and use of the national forests.....	665,000	-----	665,000	-----
805-318-2-----	Forest development, roads and trails.....	64,500,000	57,762,832	3,300,000	3,437,168
805-318-2-----	Roads and trails for States, national forests fund.....	1,733,561	618,389	480,000	635,172
<b>Total, Forests.....</b>		<b>66,898,561</b>	<b>58,381,221</b>	<b>4,445,000</b>	<b>4,072,340</b>
<b>Parks:</b>					
<b>National Park Service:</b>					
<b>Construction and rehabilitation of buildings and utilities:</b>					
707-95-1-----	Waterproofing cap and column of Memorial, Perry's Victory and International Peace Memorial, Ohio.....	15,000	-----	15,000	-----
-----	Replacement of boiler, Vanderbilt Mansion, National Historical Site, New York.....	2,500	-----	2,500	-----
707-107-1-----	Heating plant and heating and electric distribution lines to Statue, Statue of Liberty National Monument, N. Y.....	20,000	-----	20,000	-----
707-23-5-----	Grand Lake Area Development, water and sewer systems, Rocky Mountain National Park, Colo.....	13,800	-----	13,800	-----
707-23-5-----	Grand Lake Area Development, checking kiosk, Rocky Mountain National Park, Colo.....	700	-----	700	-----
707-4-3-----	Development of utilities, sewerage, power distribution systems, Carlsbad Caverns National Park, N. Mex.....	17,100	-----	17,100	-----
707-27-1-----	Development of Canyon Area, completion of sewer systems, Yellowstone National Park, Wyo.....	40,500	-----	40,500	-----
707-3-4-----	Water system at Rainbow Point, Bryce Canyon National Park, Utah.....	5,100	4,100	1,000	-----
707-18-1-----	Water-supply line, Mesa Verde National Park, Colo.....	75,000	67,000	8,000	-----
707-148-2-----	Water and sewer systems, Pierce Ferry, Boulder Dam, Nev. and Ariz.....	32,000	21,000	11,000	-----
-----	Court House, Appomattox National Historical Monument, Va.....	100,000	65,000	35,000	-----
-----	Comfort station, Watergate, Washington, D. C.....	20,000	15,000	5,000	-----
707-0-1-----	Construction and improvement of roads and trails in national parks and monuments.....	120,615,327	98,615,327	1,000,000	21,000,000
<b>Total, Parks.....</b>		<b>120,957,027</b>	<b>98,787,427</b>	<b>1,169,600</b>	<b>21,000,000</b>

\* W. P. A. and C. C. C. costs not included.

\* Blanket project consisting of several items. No docket numbers assigned.

TABLE I.—Projects recommended for fiscal year 1943—Continued

Docket No.	Name and location of project	Total estimated cost	Estimated expenditure to June 30, 1942	Recommended expenditure for fiscal year 1943	Additional expenditure required thereafter to complete
<b>LAND DEVELOPMENT AND PROTECTION—Continued</b>					
<b>Soil Conservation:</b>					
Soil Conservation Service:					
Soil and moisture conservation operations projects:					
808-30-6	Garage and repair shop Big Flats, N. Y.	\$7,000		\$7,000	
808-30-5	Equipment storage building, Big Flats, N. Y.	5,500		5,500	
808-9-3	Garage, Americus, Ga.	5,000		5,000	
808-9-4	Equipment storage building, Americus, Ga.	5,000		5,000	
808-20-2	Office and field laboratory, Allegan, Mich.	6,000		6,000	
808-14-2	Garage, Manhattan, Kans.	5,000		5,000	
Soil and moisture conservation research projects:					
808-30-1	Office and laboratory building, Marcellus, N. Y.	15,000		15,000	
808-23-1	Office and laboratory building, McCredie, Mo.	15,000		15,000	
Land utilization and retirement of submarginal land projects:					
808-29-1	Impounding dam, running-water draw projects, Clovis, Curry County, N. Mex.	382,149	\$33,900	40,000	\$308,249
Department of Interior:					
(10)	Soil and moisture conservation operations	11 98,500		98,500	
	Total, Soil Conservation	544,149	33,900	202,000	308,249
<b>Range Lands:</b>					
Grazing Service:					
	Range improvements within grazing districts	100,000		100,000	
General Land Office:					
	Range improvements outside of grazing districts	20,000		20,000	
	Total, Range Lands	120,000		120,000	
<b>Wildlife:</b>					
Fish and Wildlife Service:					
	Construction of headquarters and service buildings, cabins, water-supply systems, water-control structures, fish screens, roads, trails, fences at big-game preserves, bird refuges, fish culture stations, and the Alaska fisheries.	122,000		122,000	
	Total, Wildlife	122,000		122,000	
	Total, Land Development and Protection	2,698,926,070	1,503,612,084	266,123,243	929,190,743
<b>PROMOTION OF TRANSPORTATION</b>					
<b>Highways, Roads, and Streets:</b>					
Public Roads Administration:					
(10)	Access roads for national defense	150,000,000	30,000,000	40,000,000	80,000,000
(10)	Flight strips for national defense	10,000,000	3,000,000	2,000,000	5,000,000
(10)	Construction of roads through unappropriated or unreserved public lands	11 500,000		500,000	
Forest Service:					
805-318-2	Construction of forest highways	129,500,000	113,117,833	4,809,500	11,512,667
National Park Service:					
Construction of parkways:					
707-175-1	Natchez Trace Parkway (Tennessee, Alabama, Mississippi)	39,600,000	9,190,499	450,000	29,959,501
707-173-1	Blue Ridge Parkway (Virginia, North Carolina)	41,500,000	25,870,473	1,300,000	14,329,527
Alaska Road Commission:					
713-3-2	Palmer-Richardson Highway, 3d division	1,800,000	1,400,000	400,000	
	Total, Highways, Roads, and Streets	372,900,000	182,578,805	49,519,500	140,801,695
<b>River and Harbor Development:</b>					
Corps of Engineers:					
302-7-4	New York Harbor, dredge anchorage areas and deepen channels	15,308,000	10,252,132	1,596,000	3,459,868
302-6-3	Great Lakes to Hudson River Waterway, deepen to 14 feet and bridge alterations	27,000,000	22,013,400	269,000	4,717,600
302-7-8	New York and New Jersey Channels, dredging and rock removal	37,630,000	18,709,086	3,600,000	15,320,914
302-90-10	Southwest and South Passes, Miss. River, La., dredging and regulating works	26,029,000	25,009,000	1,020,000	
302-94-1	Sabine-Neches Waterway, Tex., Beaumont and Orange, Tex., to the Gulf of Mexico, enlarge channels	11,626,000	10,151,000	1,475,000	
302-65-4	Mississippi River between the Ohio and Missouri Rivers, dredging and regulating works	43,000,000	35,697,366	1,300,000	6,002,634
302-54-2	Mississippi River between the Missouri River and Minneapolis, Minn., locks, guard and guide walls and miscellaneous work	170,126,000	152,014,969	420,000	17,691,031
302-77-3	Missouri River, Kansas City to the mouth, dredging and regulating works	80,000,000	78,038,534	1,400,000	561,466
302-71-1	Missouri River, Kansas City, Mo., to Sioux City, Iowa, dredging and regulating works	92,000,000	83,065,192	1,400,000	7,534,808
302-33-5	Ohio River, open channel work, dredging and revetments	17,050,000	13,951,931	450,000	2,648,069

<sup>10</sup> Blanket project consisting of several items. No docket numbers assigned.<sup>11</sup> Estimates of total cost not immediately available.

TABLE I.—Projects recommended for fiscal year 1943—Continued

Docket No.	Name and location of project	Total estimated cost	Estimated expenditure to June 30, 1942	Recommended expenditure for fiscal year 1943	Additional expenditure required thereafter to complete
<b>PROMOTION OF TRANSPORTATION—Continued</b>					
<b>River and Harbor Development—Continued.</b>					
<b>Corps of Engineers—Continued.</b>					
302-108-19.....	Los Angeles and Long Beach Harbors, Calif., breakwater construction.....	\$26,664,225	\$20,870,225	<sup>11</sup> \$5,794,000	-----
302-115-1.....	Neah Bay, Wash., south side of Strait of Juan de Fuca, breakwater construction.....	2,100,000	725,000	1,375,000	-----
302-7-5.....	Buttermilk Channel, N. Y., complete deepening and widening.....	1,605,000	1,208,000	397,000	-----
302-93-5.....	Pascagoula Harbor, Miss., dredging.....	283,000	150,000	133,000	-----
	Total, River and Harbor Development.....	550,421,225	471,856,135	<sup>11</sup> 20,629,000	\$57,936,090
<b>Canals:</b>					
<b>Panama Canal:</b>					
(14).....	Improvements, betterments, and replacements of facilities.....	<sup>11</sup> 2,000,000	-----	2,000,000	-----
303-52-2.....	Construction of special protective works.....	<sup>11</sup> 10,000,000	-----	10,000,000	-----
303-52-1.....	Improvement and enlargement of the capacity of the Panama Canal.....	277,000,000	34,973,000	50,000,000	192,027,000
	Total, Canals.....	289,000,000	34,973,000	62,000,000	192,027,000
<b>Aids and Assistance to Navigation:</b>					
<b>Coast Guard:</b>					
<b>Construction of new lifeboat stations:</b>					
202-8-14.....	Miami Beach Lifeboat Station, Miami Beach, Fla.....	530,250	-----	132,000	398,250
<b>Rebuilding of existing lifeboat stations:</b>					
202-18-1.....	Ocean City Lifeboat Station, Ocean City, Md.....	179,370	-----	179,370	-----
202-28-1.....	Shark River Lifeboat Station, Avon by the Sea, N. J.....	235,220	-----	235,220	-----
202-7-1.....	Indian River Inlet Lifeboat Station, Rehoboth Beach, Del.....	249,220	-----	249,220	-----
202-45-13.....	Willapa Bay Lifeboat Station, North Cove, Wash.....	213,720	-----	213,720	-----
<b>Construction of additional shore facilities:</b>					
202-23-1.....	St. Louis, Coast Guard Depot, St. Louis, Mo.....	200,000	30,000	170,000	-----
202-7-3.....	Delaware Bay Servicing Base, Del.....	160,000	-----	132,000	28,000
202-43-2.....	Lake Champlain Servicing Base, near Burlington, Vt.....	73,000	-----	53,366	19,634
202-40-1.....	Chattanooga Repair Station, Tenn.....	60,000	-----	10,000	50,000
202-13-2.....	Dubuque Repair Station, Iowa.....	50,000	-----	30,000	20,000
202-12-1.....	Evansville Servicing Base, Evansville, Ind.....	50,000	-----	35,000	15,000
202-15-1.....	Paducah Servicing Base, Paducah, Ky.....	50,000	-----	35,000	15,000
202-52-2.....	Sand Island Depot, Honolulu, Hawaii.....	529,110	-----	340,000	189,110
<b>Construction of new light stations:</b>					
202-50-22.....	Ulakta Head Light Station, Unalaska Island, Alaska.....	250,000	100,000	150,000	-----
202-30-25.....	South Brother Island Light, N. Y.....	13,700	-----	13,700	-----
202-43-1.....	Five Mile Point Light, Lake Champlain, Vt.....	7,100	-----	7,100	-----
202-20-5.....	Moon Island Light Station, St. Mary's River, Mich.....	7,500	-----	7,500	-----
202-50-21.....	Fairway Island Light Station, Peril Strait, Alaska.....	12,500	-----	12,500	-----
202-50-13.....	Lincoln Rock Light Station, Clarence Strait, Alaska.....	15,000	-----	15,000	-----
202-20-9.....	Round Island Passage Light Station, Straits of Mackinac, Michigan.....	145,000	-----	145,000	-----
202-50-24.....	Cherikof Island Light Station, Alaska.....	250,000	-----	80,000	170,000
202-8-31.....	St. Andrews Bay Entrance Light No. 4, Fla.....	6,000	-----	6,000	-----
<b>Modernization, additions, improvements, etc., of existing shore facilities:</b>					
202-17-2.....	South Portland Coast Guard Base, South Portland, Maine.....	37,000	-----	37,000	-----
202-19-30.....	Woods Hole Repair Station, Woods Hole, Mass.....	10,000	-----	10,000	-----
202-57-4.....	Bristol Lighthouse Depot, Bristol, N. Y.....	5,000	-----	5,000	-----
202-31-9.....	Washington Servicing Base, N. C.....	8,000	-----	8,000	-----
202-1-2.....	Mobile Repair Station, Mobile, Ala.....	116,000	-----	114,100	1,900
202-54-9.....	San Juan Base, P. R.....	5,000	-----	5,000	-----
202-20-7.....	Charlevoix Depot, Charlevoix, Mich.....	30,000	-----	30,000	-----
202-35-13.....	Tongue Point Repair Station, Oreg.....	9,900	-----	9,900	-----
202-28-3.....	Shrewsbury River Servicing Base, N. J.....	12,000	-----	12,000	-----
202-35-4.....	Astoria Repair Base, Astoria, Oreg.....	107,717	-----	107,717	-----
202-54-8.....	San Juan Base, P. R.....	250,000	-----	185,000	65,000
202-47-21.....	Fountain City Repair Station, Wis.....	10,000	-----	10,000	-----
202-54-2.....	San Juan Base, San Juan, P. R.....	7,000	-----	7,000	-----
202-54-3.....	San Juan Base Wharf, San Juan, P. R.....	75,000	-----	75,000	-----
<b>Modernization, additions, improvements, etc., of existing light stations:</b>					
202-17-17.....	Matinicus Rock Light Station, 10 miles south of entrance to Penobscot Bay, Maine.....	6,000	-----	6,000	-----
202-17-18.....	Owls Head Light Station, Rockland Harbor, Maine.....	6,000	-----	6,000	-----
202-8-16.....	Dry Tortugas Light Station, Dry Tortugas, Fla.....	8,000	-----	5,000	3,000
202-45-10.....	West Point Light Station, near Seattle, Wash.....	10,700	-----	5,900	4,800
202-4-4.....	Farallon Light Station, Farallon Island, Calif.....	20,000	-----	20,000	-----
202-52-5.....	Kilauea Point Light Station, Kaula Island, T. H.....	8,000	-----	8,000	-----
202-4-47.....	Farallon Island Light Station, Calif.....	18,000	-----	18,000	-----
202-4-49.....	Punta Gorda Light Station, Calif.....	16,000	-----	16,000	-----
202-19-31.....	Wings Neck Light Station, Mass.....	6,000	-----	6,000	-----

<sup>11</sup> Contract authorization.<sup>11</sup> Includes contract authorization of \$5,794,000 for Los Angeles and Long Beach Harbors.<sup>11</sup> Blanket item consisting of several items. No docket numbers assigned.<sup>11</sup> Estimates of total cost not immediately available.

TABLE I.—Projects recommended for fiscal year 1943—Continued

Docket No.	Name and location of project	Total estimated cost	Estimated expenditure to June 30, 1942	Recommended expenditure for fiscal year 1943	Additional expenditure required thereafter to complete
<b>PROMOTION OF TRANSPORTATION—Continued</b>					
<b>Aids and Assistance to Navigation—Continued.</b>					
Coast Guard—Continued.					
Modernization, additions, improvements, etc., of existing light stations—Continued.					
202-47-20.....	Two Rivers North Pierhead Light Station, Wis.....	\$5,000	-----	\$5,000	-----
202-47-19.....	Green Bay Entrance Light Station, Wis.....	7,500	-----	7,500	-----
202-4-50.....	Santa Cruz Light, Calif.....	6,000	-----	6,000	-----
202-4-9.....	Point Montara Light Station, San Mateo County, Calif.....	5,000	-----	5,000	-----
202-4-11.....	Point Arena Light Station, Calif.....	5,000	-----	5,000	-----
202-4-48.....	Point Gabriele Light Station, Calif.....	5,000	-----	5,000	-----
202-4-30.....	Ansepa Light Station, Ventura, Calif.....	31,000	-----	8,000	\$23,000
202-6-10.....	Housatonic River Lights, Conn.....	9,000	-----	4,000	5,000
202-4-7.....	Southampton Shoal Light Station, San Francisco Bay, Calif.....	10,000	-----	10,000	-----
202-4-28.....	Ballast Point Light Station, San Diego, Calif.....	10,000	-----	10,000	-----
202-55-1.....	Ham Bluff Light Station, St. Croix, V. I.....	14,000	-----	8,300	5,700
202-56-1.....	Windward Point Light Station, U. S. Naval Station, Cuba.....	13,500	-----	7,200	6,300
202-54-7.....	Culebrita Island Light Station, P. R.....	6,300	-----	6,300	-----
202-20-32, 47, 48.	Big Sable Light Station, Mich.....	22,700	-----	22,000	700
202-4-27.....	Trinidad Head Light Station, Arcata, Calif.....	16,500	-----	16,500	-----
202-4-38.....	Point Conception Light Station, Conception, Calif.....	20,000	-----	5,000	15,000
202-50-23.....	Sentinel Island Light Station, Alaska.....	12,000	-----	12,000	-----
202-50-25.....	Point Retreat Light Station, Alaska.....	12,000	-----	12,000	-----
202-50-27.....	Mary Island Light Station, Alaska.....	12,000	-----	12,000	-----
202-4-37.....	Point Reyes Light Station, San Rafael, Calif.....	14,000	-----	14,000	-----
202-43-4.....	Slip Point Light Station, Slip Point, Strait of Juan de Fuca, Wash.....	5,150	-----	4,500	650
202-45-14.....	Lime Kiln Light Station, San Juan Island, Wash.....	5,450	-----	5,000	450
202-1-5.....	Sand Island Light Station, entrance Mobile Bay, Ala.....	8,000	-----	8,000	-----
202-17-16.....	Halfway Rock Light Station, seacoast of Maine.....	18,000	-----	18,000	-----
Modernization, additions, improvements, etc., of existing lifeboat stations:					
202-11-4.....	South Chicago Lifeboat Station, South Chicago, Ill.....	40,500	-----	22,000	18,500
202-28-12.....	Atlantic City Lifeboat Station, N. J.....	10,000	-----	9,500	500
202-4-20.....	Point Arguello Lifeboat Station, Arlight, Calif.....	80,000	-----	18,500	61,500
202-8-2.....	Fort Pierce Inlet Lifeboat Station, Fort Pierce, Fla.....	141,300	-----	141,300	-----
202-28-4.....	Barnegat Lifeboat Station, Barnegat City, N. J.....	18,000	-----	16,500	1,500
202-8-9.....	Lake Worth Inlet Lifeboat Station, West Palm Beach, Fla.....	26,000	-----	21,000	5,000
202-4-15.....	Point Reyes Lifeboat Station, Point Reyes, Calif.....	30,000	-----	30,000	-----
202-8-24.....	Ponce de Leon Inlet Lifeboat Station, Volusia County, New Smyrna, Fla.....	20,000	-----	13,170	6,830
202-19-33.....	Point Allerton Lifeboat Station—Boston Light Station, seacoast of Mass.....	5,200	-----	5,200	-----
Miscellaneous extensions and improvements of minor aids to navigation:					
202-20-50.....	Birch Point Range, Mich.....	5,000	-----	5,000	-----
202-30-3.....	Manasquan Inlet Breakwater, off Point Pleasant Beach, N. Y.....	7,500	-----	7,500	-----
-----	Projects on which funds previously appropriated will be expended in fiscal year 1943.....	2,465,717	-----	2,465,717	-----
Total, Aids and Assistance to Navigation.....		7,190,324	\$130,000	5,930,000	1,130,324
<b>Airports and Airways:</b>					
Administrator of Civil Aeronautics:					
Establishment and construction of new Federal airways and additional facilities on existing airways:					
904-45-1.....	North Dales-Yakima Airway.....	79,300	-----	79,300	-----
904-21-1.....	Minneapolis-Duluth Airway.....	133,200	-----	33,200	100,000
904-24-9.....	Great Falls-Lethbridge Airway.....	154,300	-----	24,300	130,000
904-41-39.....	Houston-Memphis Airway.....	286,800	-----	286,800	-----
904-40-3.....	Knoxville-Norfolk Airway.....	326,200	-----	326,200	-----
904-36-11.....	Pittsburgh-Birmingham Airway.....	254,400	-----	254,400	-----
904-9-25.....	Atlanta-Cincinnati Airway.....	224,800	-----	224,800	-----
904-9-24.....	Augusta-Savannah Airway.....	57,000	-----	57,000	-----
904-12-1.....	Ft. Wayne-Pittsburgh Airway.....	70,000	-----	70,000	-----
904-16-13.....	New Orleans-Birmingham Airway.....	73,800	-----	31,800	42,000
904-0-29.....	Relocations and improvements of sections of existing airways.....	170,300	-----	70,000	100,300
-----	Miscellaneous improvements to lighting facilities.....	16,500	-----	1,200	15,300
904-0-4.....	UHF radio ranges and localizers with outer and inner markers.....	6,019,000	-----	2,800,000	3,219,000
904-0-1.....	UHF fan markers.....	539,000	-----	154,000	385,000
904-0-15.....	UHF transmitters and receivers for airport traffic control.....	300,000	-----	160,000	140,000
904-0-15.....	UHF transmitters and receivers for airport approach control.....	150,000	-----	30,000	120,000
904-0-30.....	Relocation of existing radio stations.....	130,000	54,000	76,000	-----
904-0-31.....	Modernization of existing radio and communications facilities.....	316,200	-----	156,200	160,000
904-0-5.....	Airport radio landing systems.....	1,520,000	-----	800,000	720,000
-----	Projects on which funds previously appropriated will be expended in fiscal year 1943.....	10,264,800	-----	10,264,800	-----
Construction, improvement and repair of public airports for defense purposes.....		189,977,600	145,862,600	44,115,000	-----
Total, Airports and Airways.....		211,063,200	145,916,600	60,015,000	5,131,600

TABLE I.—*Projects recommended for fiscal year 1943—Continued*

Docket No.	Name and location of project	Total estimated cost	Estimated expenditure to June 30, 1942	Recommended expenditure for fiscal year 1943	Additional expenditure required thereafter to complete
<b>PROMOTION OF TRANSPORTATION—Continued</b>					
<b>Railroads:</b>					
Alaska Railroad:					
Roadway and structures:					
712-50-3	Ballast and patch ballast roadbed	\$502,050	\$100,410	\$100,410	\$301,230
712-50-4	Riprap at various points on line	293,000	58,600	58,600	175,800
712-50-6	Purchase and place culvert pipe	120,000	25,000	37,500	57,500
712-50-17	Replace wooden bridge with steel bridge, Mile 267.7	60,000		60,000	
712-50-2	Replacement of wooden bridges with steel bridges	272,700	60,000	94,200	118,500
712-50-18	Marine ways, Nenana	7,200		7,200	
	Dormitory, Broad Pass	15,000		15,000	
	Dormitory, Garner	8,000		8,000	
	Depot, Broad Pass	6,500		6,500	
	Total, Railroads	1,284,450	244,010	387,410	653,030
<b>Miscellaneous:</b>					
United States Maritime Commission:					
	Construction of training stations	1 <sup>18</sup> 1,550,000		1,550,000	
	Total, Miscellaneous	1,550,000		1,550,000	
	Total, Promotion of Transportation	1,433,409,199	835,698,550	209,030,910	397,679,739
<b>POWER GENERATION AND DISTRIBUTION</b>					
Tennessee Valley Authority:					
Navigation, flood control, and power program:					
Major unified system projects:					
2100-31-1	Kentucky Dam and Reservoir	105,000,000	52,857,515	31,878,000	20,264,485
2100-31-2	Pickwick Landing Dam and Reservoir	38,130,845	35,628,845	1,591,000	911,000
2100-31-3	Wilson Dam and Reservoir	41,694,819	38,643,819	2,237,000	814,000
2100-31-4	Wheeler Dam and Reservoir	39,064,847	36,840,847	1,767,000	457,000
2100-31-5	Quintersville Dam and Reservoir	34,074,740	31,742,740	1,426,000	906,000
2100-31-6	Hales Bar Dam and Reservoir	6,000,000	2,329,727	2,128,000	1,542,273
2100-31-7	Chickamauga Dam and Reservoir	37,650,035	34,452,035	2,295,000	903,000
2100-31-8	Watts Bar Dam and Reservoir	35,900,000	32,301,552	2,735,000	863,448
2100-31-9	Fort Loudoun Dam and Reservoir	44,000,000	23,907,818	17,073,000	3,019,182
2100-31-10, 18, 18, 21, 22	Hiwassee Projects—Includes Hiwassee Dam and Reservoir, Apalachla Dam and Reservoir, Chatuge Dam and Reservoir, Nolteley Dam and Reservoir, Gcoee Dam No. 3 and Reservoir.	55,985,271	48,878,271	6,776,000	331,000
2100-31-11	Norris Dam and Reservoir	30,855,815	30,847,815	8,000	
2100-31-12	Cherokee Dam and Reservoir	31,500,000	30,257,921	1,242,079	
2100-31-13	Watts Bar Steam Plant	18,200,000	15,220,519	2,789,921	189,560
2100-31-20	Fontana Dam and Reservoir	48,000,000	12,094,000	23,471,000	12,435,000
2100-31-17	South Fork of Holston River Dam and Reservoir	23,000,000	9,400,000	9,400,000	4,200,000
2100-31-23	Watauga River Dam and Reservoir	25,000,000	0,500,000	9,500,000	6,000,000
	Sheffield Steam Plant (additions)	4,000,000	2,000,000	2,000,000	
2100-0-1	Transmission and other electric plant	215,800,000	123,133,000	25,076,000	67,591,000
Fertilizer program:					
2100-0-2	Fertilizer plant—Muscle Shoals and Mobile, Ala., and Columbia, Tenn.	15,881,000	8,561,000	4,520,000	2,800,000
Related property operations program:					
Service facilities at Wilson Dam, Reservation No. 2:					
2100-31-29	Fleet Harbor Area	2,700,000	500,000	1,100,000	1,100,000
2100-31-26	Main Road System	500,000	250,000	210,000	40,000
2100-31-27	Railroad System	800,000	300,000	50,000	250,000
2100-31-30	Garage	225,000	200,000	25,000	
2100-31-28	Chemical Plant Area	1,575,000	800,000	775,000	
Bonneville Power Administration:					
Transmission system of 230-kilovolt lines:					
711-202-2	Grand Coulee-Covington, No. 2 line	4,516,920	2,443,000	2,073,920	
711-207-1	Keiso-Longview (double circuit)	298,140	170,000	128,140	
711-206-2	North Vancouver-Covington, No. 2 line	3,742,310	2,200,000	1,542,310	
711-203-3, 4	Grand Coulee-Spokane, No. 3 & 4 lines (double circuit)	3,399,210		2,795,115	604,095
711-202-3, 4	Grand Coulee-Covington, No. 3 & 4 lines	9,117,900	4,428,530	3,899,725	789,645
711-205-2	Covington-Seattle, No. 2 line	300,510	172,000	128,510	
711-209-3, 4	North Vancouver-St. Johns, No. 3 & 4 lines	712,090		612,090	100,000
711-200-2	Substation construction and additions at various points	17,413,000	8,238,470	5,000,000	4,174,530
Transmission system of 115-kilovolt lines:					
711-110-1	Trafton-Bellingham	786,220	387,000	399,220	
711-105-1, 2	Covington-Renton, No. 1 & 2 lines	256,290	150,000	106,290	
711-106-2	Covington-Tacoma, No. 2 line	209,680	125,000	84,680	
711-300-2	Feeder lines, service connections to load areas, industrial customers, etc.	14,217,000	5,000,000	3,930,000	5,287,000
	Projects on which funds previously appropriated will be expended in fiscal year 1943	12,600,000		12,000,000	

<sup>18</sup> Estimates of total cost not immediately available.



TABLE I.—Projects recommended for fiscal year 1943—Continued

Docket No.	Name and location of project	Total estimated cost	Estimated expenditure to June 30, 1942	Recommended expenditure for fiscal year 1943	Additional expenditure required thereafter to complete
<b>POWER GENERATION AND DISTRIBUTION—Continued</b>					
Corps of Engineers:					
Power installation projects:					
302-112-3.....	Columbia River at Bonneville, Oreg., hydroelectric plant.....	\$39,180,000	\$35,014,000	\$4,166,000	.....
302-66-3.....	Missouri River at Fort Peck, Mont., hydroelectric plant.....	5,845,000	4,845,000	1,000,000	.....
	Total, Power Generation and Distribution.....	967,931,642	643,820,424	188,530,000	\$135,572,218
<b>WELFARE AND HEALTH</b>					
Public Water Supply, Sanitation, and Sewer Systems:					
International Boundary Commission, U. S. and Mexico:					
104-4-2.....	Douglas Sanitation Project, Douglas, Ariz.....	90,000	.....	75,000	15,000
	Total, Public Water Supply, Sanitation, and Sewer Systems.....	90,000	.....	75,000	15,000
Welfare and Health Facilities:					
Veterans' Administration:					
Construction providing additional beds:					
2000-23-2.....	Dearborn, Mich., construction providing 100 additional G. M. beds.....	297,000	.....	297,000	.....
2000-96-2.....	Marion, Ill., 367 domiciliary beds.....	710,000	.....	710,000	.....
2000-90-1.....	Pennsylvania Area, new veterans' administration facility (400 hospital beds).....	2,075,000	75,000	2,000,000	.....
2000-97-1.....	Saratoga Springs, N. Y., new facility.....	1,620,000	.....	100,000	1,520,000
Major reconditioning, replacements, alterations, and new construction at existing facilities:					
2000-12-1.....	Bronx, N. Y., alterations to existing buildings.....	42,000	.....	42,000	.....
2000-17-1.....	Chillicothe, Ohio, replacement of water softeners.....	30,000	.....	30,000	.....
2000-31-2.....	Fort Howard, Md., boiler house, refrigeration equipment, elevators, service lines, etc.....	500,000	.....	500,000	.....
2000-33-1.....	Fort Lyon, Colo., replacement of boilers.....	40,000	.....	40,000	.....
2000-43-2.....	Legion, Tex., repair and replace outside services.....	70,000	.....	70,000	.....
2000-43-3.....	Legion, Tex., connecting corridors and dining room changes.....	80,000	.....	80,000	.....
2000-47-19.....	Los Angeles, Calif., administration and clinical building.....	450,000	.....	450,000	.....
2000-54-3.....	Muskogee, Okla., continue alterations, building No. 1.....	62,000	.....	62,000	.....
2000-56-1.....	Northampton, Mass., replacement of steam lines.....	35,000	.....	35,000	.....
2000-67-1.....	Roseburg, Oreg., sewage disposal plant.....	35,000	.....	35,000	.....
2000-72-4.....	St. Cloud, Minn., replacement of boilers.....	65,000	.....	65,000	.....
2000-71-2.....	Sheridan, Wyo., new boiler plant.....	140,000	.....	140,000	.....
2000-85-9.....	Wood, Wis., electric generator.....	46,000	.....	46,000	.....
Bureau of Indian Affairs:					
Construction, repair, and rehabilitation of buildings and utilities:					
Alaska jurisdiction:					
706-81-1.....	Schools and quarters.....	18,000	.....	18,000	.....
	General repairs and improvements.....	25,000	.....	25,000	.....
706-1-2.....	Blackfeet Agency, Mont., improvements to utilities.....	6,000	.....	6,000	.....
706-2-4.....	Carson Agency, Nev., improvements to utilities.....	3,500	.....	3,500	.....
706-5-3.....	Cheyenne River Agency, S. Dak., improvements to utilities.....	42,000	.....	42,000	.....
706-13-1.....	Crow Creek Agency, S. Dak., general repairs and improvements.....	4,500	.....	4,500	.....
706-17-5.....	Fort Apache, Ariz., remodeling school dormitories for sanatorium use.....	35,000	.....	35,000	.....
706-18-3.....	Fort Belknap, Mont., improvements to utilities.....	11,500	.....	11,500	.....
706-31-1.....	Klamath Agency, Oreg., garage.....	7,000	.....	7,000	.....
706-33-2.....	Mescalero Agency, N. Mex., general repairs and improvements.....	5,000	.....	5,000	.....
706-35-2.....	Navajo Agency, N. Mex. and Ariz., improvements to utilities.....	10,000	.....	10,000	.....
706-44-1.....	Pine Ridge Agency, S. Dak., warehouse and office.....	4,000	.....	4,000	.....
706-65-1.....	Tacoma Sanatorium, Wash.....	895,000	800,000	95,000	.....
706-76-2.....	Warm Springs Agency, Oreg., improvements to utilities.....	4,000	.....	4,000	.....
706-79-1.....	Winnebago Agency, Nebr., improvements to utilities.....	20,000	.....	20,000	.....
	Construction, extension, and equipment of public school facilities in cooperation with public school districts in the State of Minnesota.....	185,500	125,500	60,000	.....
	Projects on which funds previously appropriated will be expended in fiscal year 1943.....	1,459,500	.....	1,459,500	.....
706-0-3.....	Construction of roads and bridges on Indian reservations.....	27,500,000	19,648,565	1,500,000	6,351,435
St. Elizabeths Hospital:					
1108-49-1.....	Continuous treatment buildings for the care of mental patients.....	700,000	400,000	300,000	.....
	Total, Welfare and Health Facilities.....	37,232,500	21,049,065	8,312,000	7,871,435
Penal and Correctional Institutions:					
Bureau of Prisons:					
Extensions to facilities at existing institutions:					
401-0-1.....	McNeil Island, Wash.....	80,000	.....	80,000	.....
	Leavenworth, Kans. (Main).....	10,000	.....	10,000	.....
	Chillicothe, Ohio.....	15,000	.....	15,000	.....
	El Reno, Okla.....	15,000	.....	15,000	.....

TABLE I.—Projects recommended for fiscal year 1943—Continued

Docket No.	Name and location of project	Total estimated cost	Estimated expenditure to June 30, 1942	Recommended expenditure for fiscal year 1943	Additional expenditure required thereafter to complete
<b>WELFARE AND HEALTH—Continued</b>					
<b>Penal and Correctional Institutions—Continued.</b>					
<b>Bureau of Prisons—Continued.</b>					
<b>Extensions to facilities at existing institutions—Continued.</b>					
	Petersburg, Va.....	\$115,000		\$115,000	
	Ashland, Ky.....	25,000		25,000	
	La Tuna, Tex.....	25,000		25,000	
	Milan, Mich.....	15,000		15,000	
	Sandstone, Minn.....	15,000		15,000	
	Tallahassee, Fla.....	30,000		30,000	
	Texarkana, Tex.....	25,000		25,000	
	Total, Penal and Correctional Institutions.....	370,000		370,000	
	Total, Welfare and Health.....	37,692,500	\$21,049,065	8,757,000	\$7,886,435
<b>GOVERNMENT ADMINISTRATION</b>					
<b>Public Buildings:</b>					
<b>Architect of the Capitol:</b>					
	Reconstruction of roofs and skylights, House and Senate wings, U. S. Capitol.....	585,000	96,000	489,000	
<b>Public Buildings Administration:</b>					
(17)	Construction of public buildings outside District of Columbia.....	<sup>18</sup> 133,500,000	91,500,000	4,500,000	37,500,000
<b>Construction of public buildings within District of Columbia:</b>					
1201-49-23	Site and building, West Central Heating Plant.....	3,900,000	3,725,234	174,766	
1201-49-17	Site and building, General Accounting Office.....	9,850,000	1,830,000	5,000,000	3,020,000
1201-49-21	Site and building, War Department.....	9,800,000	9,351,086	448,914	
1201-49-22	Site and construction, Federal Office Buildings Nos. 2 and 3.....	7,300,000	6,986,693	313,307	
1201-49-20	Installation of facilities, National Archives Building.....	500,000	450,000	50,000	
	Site, Army Medical Library and Museum.....	500,000		500,000	
(17)	Sites for and construction of general office buildings.....	25,000,000	15,000,000	9,000,000	1,000,000
<b>Government of the Virgin Islands:</b>					
(17)	Improvements and alterations in buildings, etc.....	5,000		5,000	
<b>Foreign Service Buildings Office:</b>					
	Legation and office building, Canberra.....	<sup>19</sup> 225,000	150,000	50,000	25,000
	Minister's residence and combined office quarters, Quito.....	<sup>19</sup> 110,000	80,000	10,000	20,000
	Combined office and residence, Para.....	<sup>19</sup> 40,000	30,000	10,000	
	Residence for First Secretary, Ciudad Trujillo.....	<sup>19</sup> 40,000		8,000	32,000
	Improvements to Embassy at Rio de Janeiro.....	<sup>19</sup> 46,000		46,000	
	Residence, Panama.....	<sup>19</sup> 221,000	200,000	21,000	
	Secretary's residence, Managua.....	<sup>19</sup> 28,000		28,000	
	Purchase of protective property, Buenos Aires.....	60,000		60,000	
<b>Corps of Engineers:</b>					
	General office building in Arlington County, Va.....	31,000,000	20,000,000	10,000,000	1,000,000
	Total, Public Buildings.....	222,710,000	149,399,013	30,713,987	42,597,000
<b>Research Facilities:</b>					
<b>National Advisory Committee for Aeronautics:</b>					
<b>Ames Aeronautical Laboratory, Moffett Field, Calif.:</b>					
1700-2-8	Full Scale Wind Tunnel.....	6,451,987	500,000	4,000,000	1,951,987
1700-2-6	Supersonic Wind Tunnel.....	2,200,000	200,000	1,500,000	500,000
1700-2-23	Low Turbulence Tunnel.....	2,407,500	100,000	1,500,000	807,500
<b>Aircraft Engine Research Laboratory, Cleveland, Ohio:</b>					
1700-3-1	Engine Research Building.....	5,100,500	3,000,000	2,100,500	
1700-3-2	Engine Research Wind Tunnel.....	4,137,000	2,000,000	2,137,000	
1700-3-6	Roads, Walks, and Utilities.....	1,433,000	800,000	633,000	
1700-3-12	Refrigerated Wind Tunnel.....	671,000		671,000	
<b>Office of Experiment Stations:</b>					
812-54-5	Lump sum for miscellaneous small construction items and improvements, Federal Experiment Station, Mayaguez, P. R.	12,000		12,000	
<b>Special Research Fund, Department of Agriculture:</b>					
	Research laboratories and facilities for research in major agricultural regions of the United States.....	31,000		31,000	
<b>Bureau of Animal Industry:</b>					
802-0-1	Lump sum for miscellaneous small construction items at farm and laboratory buildings.....	17,000		17,000	
<b>Bureau of Dairy Industry:</b>					
	Lump sum for miscellaneous small construction items at dairy farm buildings, laboratories, etc.....	8,000		8,000	
<b>Bureau of Plant Industry:</b>					
806-0-1	Minor construction at various field stations.....	13,000		13,000	
	Removal and reestablishment of Arlington Farms, Va.....	3,200,000	2,200,500	800,000	199,500

<sup>17</sup> Blanket project consisting of several items. No docket numbers assigned.<sup>18</sup> Authorized limit of costs in acts of Aug. 25, 1937, June 21, 1938, and June 27, 1940.<sup>19</sup> Includes furnishings.

TABLE I.—*Projects recommended for fiscal year 1943—Continued*

Docket No.	Name and location of project	Total estimated cost	Estimated expenditure to June 30, 1942	Recommended expenditure for fiscal year 1943	Additional expenditure required thereafter to complete
	<b>GOVERNMENT ADMINISTRATION—Continued</b>				
	<b>Research Facilities—Continued</b>				
	Bureau of Agricultural Economics:				
	Warehouse.....	\$34,000		\$34,000	
	Bureau of Agricultural Chemistry and Engineering:				
801-22-2.....	Water tower fire protection system, U. S. Cotton Ginning Laboratory, Stoneville, Miss.	20,000		20,000	
	Lump sum for miscellaneous small construction items.....	3,000		3,000	
	Conservation and use of agricultural land resources:				
	Construction and equipment of four regional research laboratories.....	7,800,000	\$7,753,000	47,000	
	Bureau of Entomology and Plant Quarantine:				
	Construction of field laboratories, etc.....	7,000		7,000	
	Beltsville Research Center:				
	Construction and improvement of roads.....	10,000		10,000	
	Coast and Geodetic Survey:				
	Construction of seismograph station vaults.....	4,000		4,000	
	Construction of tide stations.....	1,500		1,500	
	Geological Survey:				
	Construction of gaging stations.....	65,000		65,000	
	Bureau of Mines:				
	Construction and equipment of manganese beneficiation pilot plants.....	163,000		163,000	
	State Department:				
	Cooperation with the American Republics:				
	Structures for research projects.....	10,000		10,000	
	Total, Research Facilities.....	33,799,487	16,553,500	13,787,000	\$3,458,987
	<b>Law Enforcement:</b>				
104-2-1.....	International Boundary Commission, U. S. and Mexico:				
	Fence construction, International Boundary.....	580,000	71,000	4,000	505,000
	Total, Law Enforcement.....	580,000	71,000	4,000	505,000
	Total, Government Administration.....	257,089,487	166,023,513	44,504,987	46,560,987
	<b>HOUSING</b>				
	<b>Executive Office of the President:</b>				
(11).....	Construction of temporary shelter in defense areas, through agencies designated by the President.....	316,000,000	171,500,000	144,500,000	
	<b>Federal Works Agency:</b>				
(11).....	Construction of national defense housing.....	640,000,000	355,000,000	285,000,000	
	Total, Housing.....	956,000,000	526,500,000	429,500,000	
	<b>MISCELLANEOUS</b>				
(11).....	<b>District of Columbia:</b>				
	Construction of public-school buildings, water and sewer systems, institutions, sanatoria, etc.....	\$8,587,000		8,587,000	
	Total, District of Columbia.....	8,587,000		8,587,000	
(11).....	<b>Community Facilities:</b>				
	Construction of Federally financed defense public works projects.....	126,000,000	54,600,000	71,400,000	
	Total, Community Facilities.....	126,000,000	54,600,000	71,400,000	
	Total, Miscellaneous.....	134,587,000	54,600,000	79,987,000	
	Grand Total, Construction Agencies (Class I).....	11,085,635,898	3,751,303,636	5,817,442,140	1,516,890,122

<sup>10</sup> Estimates of total cost not immediately available.

<sup>11</sup> Blanket project consisting of several items. No docket numbers assigned.

**Table II.—SURVEYS UNDER WAY AS OF DECEMBER 1, 1941, OR COMPLETED WITH FAVORABLE REPORTS SINCE DECEMBER 1, 1940, BY CONSTRUCTION AGENCIES (CLASS I)**

This table summarizes the surveys reported by the Federal construction agencies (Class I) to the National Resources Planning Board under the terms of Executive Order No. 8455. It includes surveys under way as of December 1, 1941, and surveys which have been completed with favorable reports since December 1, 1940. Surveys completed during the year with reports unfavorable to proposed construction projects are not included.

The table includes only investigations made by those construction agencies (Class I) which maintain formalized survey procedures leading to the preparation of plans or estimates for construction projects. However, no surveys of a strictly defense or war-emergency nature are listed. The information pertaining to the latter types of surveys is confidential. Examples of such surveys not listed in Table II are the investigations of need for defense housing and community facilities, and the studies for the location of Army and Navy military establishments and defense plants.

The status of the survey programs of the various construction agencies becomes important in any consideration of plans for future construction programs of the Government. The survey work is a necessary first step to the proposing of projects and the preparation of detailed plans and specifications. Thus, the volume and timing of survey work must be so controlled that plans may be prepared and construction may begin without delay as soon as funds are appropriated for construction programs.

Practically all of the surveys in Table II will contribute to the building up of the "shelf" or reservoir of projects envisaged by the Employment Stabilization Act of 1931, to be undertaken in the post-war readjustment program. At present, this "shelf" or reservoir of work consists of the additional expenditures required to complete the projects recommended for construction in the fiscal year 1943 as listed in Table I, plus the projects available for construction in future years, summarized in Table III. Many of the surveys reported as completed in Table II have developed into projects now under construction or now in the reservoir, and many more projects will flow into the reservoir as surveys now reported in Table II as being under way are completed.

### Completed Surveys

The completed surveys listed in Table II may be divided into three main groups, as follows:

1. Surveys which have developed into projects which are now under construction or for which funds have been appropriated for construction.

2. Surveys which have developed into projects now authorized for construction, or for which authorization is pending.

3. Surveys which have not yet developed into active or authorized construction projects.

The first group consists largely of investigations for location of airport and airway facilities, and for development of river and harbor, flood control, and hydroelectric projects vital to the national defense. The surveys in this group range from the relatively simple types involving location of sites for air navigation facilities to the more involved types requiring detailed studies to determine the feasibility and economic practicability of multiple-purpose reservoir projects. Because of the emergency nature of many of the projects involved, surveys of this group have been speeded to completion during the year, and many have been completed ahead of schedule.

The second group of completed surveys—those which have developed into projects authorized or with authorizations pending—consists largely of flood control and river and harbor investigations undertaken by the Corps of Engineers, and surveys of hydroelectric power developments by the Federal Power Commission. A number of projects originating from surveys of this group have been authorized by the Flood Control Act of August 18, 1941,<sup>1</sup> while a great many more are included in the Omnibus Rivers and Harbors Bill<sup>2</sup> now pending before the Congress. Authorization of these projects, however, is not nor will be any guaranty of their construction, since it is the Government's policy at this time to defer requests for appropriations for all projects except those which have an appreciable and direct value to the war effort. However, authorization enables the preparation of detailed plans and specifications for use at a later date.

The third group of completed surveys consists of those which were not considered sufficiently important or pressing to be authorized at this time. The projects proposed in this group constitute a relatively unimportant segment of the reservoir of future works, as the current practice has been to carry most of the projects through the authorization stage, and defer

<sup>1</sup> P. L. 228, 77th Congress.

<sup>2</sup> H. R. 5993, 77th Congress.

the appropriation of funds for construction. Insofar as this policy operates to encourage the preparation of plans well in advance of construction, it is of great benefit in the formulation of a sound program of public works for the post-war period.

### Surveys Under Way

The surveys included in Table II which were under way as of December 1, 1941, include those which may lead to reports recommending construction projects, and those which may result in reports unfavorable to the construction of the projects proposed. No estimate can be given as to the relative proportions of potentially favorable and unfavorable surveys included in the table.

Of the surveys under way, a large number of those undertaken by the Bureau of Reclamation for irrigation and power, and the Department of Agriculture for flood control are sufficiently far advanced to indicate the volume of construction involved in the over-all program which may result from the surveys. For instance, the cost of flood control improvements now under survey in the Department of Agriculture's water-flow retardation and soil erosion prevention program is estimated ultimately to exceed \$300,000,000.

### Purpose Classification

The most important class of surveys, by purpose classification, is that group which leads to projects involving the development and protection of land. In this group are included the flood control and multiple-purpose surveys of the Corps of Engineers, the Tennessee Valley Authority, and the Federal Power Commission; the flood control and water facilities surveys of the Department of Agriculture; and the irrigation and power investigations of the Bureau of Reclamation, and the Bureau of Indian Affairs. Surveys for irrigation and water facilities are largely carried on west of the 100th meridian, while flood control and power surveys are more widely distributed throughout the country. Projects resulting from surveys in this classification constitute the largest single group of projects in the reservoir, if the power features of multiple-purpose projects are included.

Second only in importance to the above group, are those surveys leading to projects for the promotion of transportation. Included in this classification are surveys of river and harbor improvements by the Corps of Engineers and surveys for location of airports and airways conducted by the Civil Aeronautics Administration. The surveys for location of airports and airways have assumed new importance since the national defense emergency, and now rival in importance the surveys for improvement of rivers and harbors, in the cost of the resultant projects.

Practically all of the surveys listed in Table II fall into the two classifications described above. Some few surveys are concerned with development of facilities for Government administration, but they do not constitute a significant part of the total.

### Agency and Areal Classification

An explanation of the scheme of classification of surveys by agency and area, and the corresponding significance of the docket numbers, will be of some assistance in a study of Table II.

As a first step, surveys are classified as to the agency reporting them to the National Resources Planning Board under Executive Order No. 8455. For example, all surveys of the Corps of Engineers carry the initial number "302"; surveys of the Tennessee Valley Authority carry the initial number "2100," etc. Projects of these agencies carry the same first numbers as do the surveys, but the letter "S" is placed before the first number of all surveys to distinguish them from projects. Thus, the first portion of a docket number for a survey of the Corps of Engineers is written, "S-302."

As a second step, surveys are grouped into the areal classifications appropriate for each agency and for the particular type of survey. For example, all surveys relating to the development of water resources are classified by the major drainage basins of the country, and surveys relating to development of transportation, and construction of projects for Government administrative, education, welfare, and health facilities are classified by States. Some agencies, such as the National Park Service and the Bureau of Indian Affairs, have their own specialized classification systems; the Bureau of Indian Affairs, for instance, classifies surveys by Indian agencies. The areal classification is indicated by the middle number of the docket, and all agencies using the same areal classification refer to surveys in a specific area by the same areal number. Thus, the number "9" represents the Susquehanna River Basin for all agencies using the drainage basin classification. A Corps of Engineers' survey in the Susquehanna River Basin would thus be represented by the docket number S-302-9-. Similarly, the number "20" represents the State of Michigan for surveys of all agencies using the State classification. As stated before, the National Park Service and the Bureau of Indian Affairs are among those agencies using special classifications, and the areal numbers assigned to their surveys are not comparable with surveys of other agencies.

As a final step, surveys are assigned a third number within each agency and areal grouping in the order of their receipt by the Board. According to this method, the first survey reported by the Corps of Engineers for the Susquehanna River Basin would bear the number S-302-9-1; and the first survey reported by the Civil

Aeronautics Administration for the State of Michigan would carry the docket S-904-20-1. The number assigned to a survey when first reported is used in any subsequent reference to that particular survey.

In order to provide further details as to the relative importance of the surveys summarized in Table II, brief statements are presented concerning the important features of the survey programs of the various agencies.

### Independent Offices and Establishments

#### Federal Power Commission

Surveys of hydroelectric power possibilities in the river basins throughout the country are made by the Federal Power Commission under the general authority of the Federal Power Act, including Section 7 (b). Through cooperative relationships developed with the Corps of Engineers, the Commission investigates power possibilities at dam and reservoir projects under the jurisdiction of the Engineers, and submits its recommendations to the Chief of Engineers.

Prior to December 1, 1940, the Commission had completed survey work and submitted reports on the power aspects of a number of reservoirs in the North Atlantic States and the Ozarks area of Arkansas and Missouri. The recommendations were taken into consideration by the Corps of Engineers in the preparation of definite plans for construction of some of these projects.

During the current year, the survey work of the Commission has been accelerated due to the increased need for power for national defense. A total of 17 surveys have been reported as under way or having been completed with favorable reports during the year. In addition to the surveys listed in the table the Commission conducted a number of surveys leading to unfavorable reports. Other surveys not listed in the table include a number recently begun by the Commission, but not yet reported to the Board.

Surveys completed in this and preceding years supplied the basic data for projects listed in the Power Commission's national defense power plan submitted to the President in July 1941. This plan provides for an orderly and coordinated development of the hydroelectric power resources of the country, as well as an expansion of the steam power plant capacity. Some of the projects listed in this plan are already under construction, while others are being considered for construction or authorization.

Among the important surveys completed during the year are those involving projects now under construction by the Corps of Engineers. These include the Wolf Creek Dam and Reservoir project on the Cumberland River in Kentucky, where an initial power installation of 125,000 kilowatts capacity may be provided; the

Bluestone Dam and Reservoir project on the New River in West Virginia, for which the Commission recommends an initial power installation of 60,000 kilowatts; and the Norfolk Dam and Reservoir project on the White River in Arkansas and Missouri, at which an initial installation of 60,000 kilowatts is being provided. The power to be made available upon completion of these projects will be used by industries engaged in war production.

Other important surveys completed during the year are those on projects not yet authorized for construction, but on which the Corps of Engineers has also been conducting surveys. An example of this type of survey is that of the Hungry Horse Reservoir project on the South Fork of the Flathead River in Montana. Where the Power Commission recommends projects on the bases of these surveys, such projects are included in the "shelf" of construction work summarized in Table III.

Of the surveys now under way, the most important are those of the Contoocook River Basin, N. H., the Alabama-Coosa River development in Alabama, the Youghiogheny River Basin in Pennsylvania, the Markham Ferry and Fort Gibson projects on the Grand River in Oklahoma, the Tenkiller Ferry and Wister Reservoirs in the Arkansas River Basin, Okla., the Brazos River, Tex., and the Detroit Dam and Reservoir on the North Santiam River, Oreg. In some cases, projects are already authorized or under construction at these sites, and in other cases, the surveys are sufficiently far advanced that recommendations for specific projects have been made by the Commission. In such cases, projects involved in surveys under way appear either in Table I as projects under construction or scheduled for the fiscal year 1943, or in Table III as projects for construction in later years. In all cases where projects are under construction or authorized for construction, the fact is indicated by appropriate footnotes in Table II.

#### Tennessee Valley Authority

Surveys are currently under way for the coordinated development of the Tennessee Valley, including further power development of the Upper Tennessee, and flood control of the affected areas in the Valley. The survey of hydroelectric power possibilities has been partially completed during the year, and a number of the resultant projects have already been put under construction, after funds were provided in supplementary appropriation acts during 1941. Other projects resulting from this survey are programmed for the fiscal year 1943. Requirements for national defense have created a great demand for power in the Tennessee Valley and surrounding areas, causing the normal survey and construction program of TVA to be accelerated.



Another survey partially completed during the year involves the determination of requirements for physical service facilities at the various properties of the TVA. A general plan for development of facilities at Wilson Dam has been completed, and the projects are scheduled for construction during the fiscal year 1943. Similar requirements for other TVA properties are being made the subject of study as this survey continues.

Other surveys under way include studies of flood hazards in the Valley, and studies involving improvements at Hales Bar Dam and methods of preventing leakage at the Great Falls Dam.

Although the requirements of national defense have speeded up the survey and construction program of the Tennessee Valley Authority, and placed greatest emphasis upon power installations, the long-term goal of the coordinated development of the Valley remains unchanged.

## Department of Agriculture

### Flood Control Surveys

The Flood Control Act of June 22, 1936, directs the Department of Agriculture to conduct investigations on watersheds throughout the country for development of programs of run-off and water flow retardation and soil erosion prevention in the interest of flood control. This and subsequent flood control acts specify the watersheds to be studied by the Department of Agriculture and the Corps of Engineers for flood control. Although the studies of the Department are separate and distinct from those of the Corps of Engineers and are reported on separately, there is cooperation between the agencies in the mutual use of data and findings. Such cooperation leads to coordination of results before completion of the reports and submission to the Congress, thus eliminating duplication of effort and resulting in preparation of integrated flood control programs.

The Department is currently engaged in conducting such flood control surveys on a large number of watersheds throughout the country. Many of the surveys have been under way since 1938 and 1939, and it has been possible to make some estimates as to the size of a country-wide program of agricultural works for flood control. Present indications place this reservoir of work available for the post-defense period at a sum exceeding \$300,000,000. Table III, however, does not include this total, as the program is still in the survey stage. The only exceptions to this are the Los Angeles and Trinity River flood control programs. The Los Angeles program is now under construction, while the Trinity River, Texas, construction program of \$4,250,000 is included in the "shelf" of projects in Table III.

It is anticipated that many of the surveys now under way will be brought to completion during the next year or two, and that the recommended projects will form a portion of the reservoir of work available for undertaking during the post-war period. The type of project resulting from the surveys is peculiarly adaptable to inclusion in a long-term improvement program, covering a period of up to 15 years.

### Water Facilities Surveys

Under the provisions of the Water Facilities Act of 1937, as amended, the Department of Agriculture conducts surveys of watersheds in the arid and semi-arid regions of the West for development of facilities for water storage and utilization. Actual conduct of the surveys is under jurisdiction of the Bureau of Agricultural Economics, the research and planning agency of the Department of Agriculture. The surveys lead to the preparation of "Area Plans," which include recommendations for improved use of the land and water resources and for construction of certain water facilities. When area plans are approved by the Water Facilities Board of the Department, they are put into operation by the Soil Conservation Service and the Farm Security Administration.

As of December 1, 1941, approximately 90 surveys leading to the preparation of area plans were under way, and 10 others had been completed during the year. Prior to December 1, 1940, approximately 40 area plans had been completed and approved for operations projects. In addition, a total of 35 preliminary surveys known as "Operations Guidance Reports" were approved prior to December 1, 1940. These preliminary surveys were prepared so that projects could be put into operation in areas where the need was great, in advance of the preparation of detailed surveys.

Many of the watersheds involved in the Water Facilities survey program are also under study by the Bureau of Reclamation, the Corps of Engineers, and other Federal agencies. Cooperative relationships have been developed in such cases, to facilitate the survey work by the mutual interchange of information. Detailed procedures for the preparation of area plans have been evolved by the Department of Agriculture and set forth in the "Water Facilities Procedure Manual" and "Water Facilities Area Planning Handbook."

Amendments to the Water Facilities Act have restricted the Federal cost of any one project to be built under the program to \$50,000 in order to eliminate overlapping with similar programs carried on by other agencies. As a result, the total volume of construction involved in the Water Facilities program is not large when compared with construction programs of other agencies operating in the same field. The projects

proposed as a result of these surveys are not included in Table III, the "shelf" of public works of construction agencies (Class I) because the actual construction under the program is carried on by non-Federal agencies with technical and financial assistance from the Federal government.

A valuable byproduct of the Water Facilities surveys is the collection of a large mass of detailed information on the physical and economic resources of many drainage basins in the West for which basic data had previously been lacking.

## Department of Commerce

### Civil Aeronautics Administration

The surveys conducted by the Civil Aeronautics Administration include studies of routes and locations for establishment of navigation facilities along the Federal airways, and investigations for the selection of sites for airports to be constructed or financed for construction by Federal agencies. All surveys undertaken during the year for establishment of air-navigation facilities have been completed, and the projects resulting are either scheduled for construction before or during the fiscal year 1943 or have been deferred for construction in later years. Surveys have been completed for the development of long-term programs for installation of radio landing systems at key airports throughout the country, for installation of approach light lanes at key airports, for replacement of intermediate frequency radio ranges by ultra-high-frequency ranges on all airways, for installation of ultra-high-frequency localizers for aid in "blind" landings at all scheduled air-mail stops on the airways, and for improvement of intermediate fields on Federal airways. In addition, a survey was completed for the establishment of air-navigation facilities on Federal airways in Alaska.

The second and third Nation-wide surveys of public airports necessary for national defense were conducted during the year, supplementing the first such survey made in October of 1940. The first national defense survey of airports resulted in a construction program put under way during 1941 through which approximately 250 strategic airports are being improved. The second such survey was completed in July 1941, and recommended improvement of 149 additional airports at a cost in excess of \$46,000,000. The projects covered in this survey were authorized and funds appropriated in the regular Department of Commerce appropriation act for the 1942 fiscal year.

As of December 1, 1941, a third defense airport survey was under way for selection of approximately 100 additional airports to be improved. Appropriations for improvement of these airports are included in the Third Supplemental National Defense Approp-

priation Act of 1942, approved December 17, 1941, the work to be undertaken during 1942.

These surveys for improvement of airports for national defense are a logical outgrowth of the original Nation-wide airport survey conducted by the Civil Aeronautics Authority in 1939.<sup>3</sup> The original survey resulted in recommendations for an over-all program of airport improvement for the entire United States, involving some 4,000 existing or proposed airports. The projects proposed in this first survey are included in the "shelf" of projects in Table III, while projects resulting from the national defense surveys undertaken in 1940 and 1941 are being undertaken immediately and appear in Table I as projects currently under way or scheduled for the fiscal year 1943.

## Department of the Interior

### Bureau of Reclamation

Under the general authority of the Reclamation Act of 1902, as amended, and the Water Conservation and Utilization Act, the Bureau of Reclamation conducts surveys for irrigation, water utilization, and production and transmission of electric energy in the West. The surveys have been a continuing activity of the Bureau in its work of determining the irrigation potentialities of the western lands. During 1940 and 1941, however, the survey work has been increased greatly in order to develop a "shelf" of public works projects for the post-war period.

As of December 1, 1941, some 140 surveys were reported as being under way. During the 1940 fiscal year almost \$1,000,000 was available for survey work, and this has been increased to approximately \$2,000,000 for the 1942 fiscal year. It is probable, therefore, that many new investigations will be undertaken during the calendar year 1942, in addition to those already under way.

The surveys range from relatively small investigations for irrigation works in individual watersheds to comprehensive basin-wide surveys of large drainage areas, involving a number of individual surveys. An example of this latter type is the basin-wide survey of the Colorado River Basin, first authorized by the Boulder Canyon Project Act, approved December 21, 1928. At least 11 individual surveys, many of them major undertakings in themselves, have been reported under way as portions of this general survey. Other basin-wide investigations are the surveys of the Missouri River, Big Horn River, Yellowstone Basin, North Canadian River, Red River and tributaries, Weiser River Basin, Willamette River and tributaries, and the Rogue River. In the list of Bureau of Reclamation surveys in Table II, the relationships between basin-

<sup>3</sup> H. D. 245, 76th Congress.

wide and individual surveys are indicated wherever they occur by appropriate references at the end of each description of survey.

In general, two classes of surveys are now under way: (1) those leading to construction of so-called "regular" reclamation projects, as distinguished from (2) those leading to construction of "Wheeler-Case" projects first authorized by the Water Conservation and Utilization Act of 1939. The chief difference lies in the size and scope of projects resulting from the surveys, the regular reclamation projects being the larger and more likely to include provision for development of power.

An important survey completed during the year was that of the Bullshead Reservoir (Davis Dam) on the Colorado River in Arizona and Nevada, for the provision of hydroelectric power facilities needed for war production. The project was subsequently authorized and is now under construction.

Many of the surveys authorized by the Water Conservation and Utilization Act have progressed to a point where it is possible to estimate the cost of an over-all program of water conservation and utilization. Present estimates place the cost of the program at a figure in excess of \$50,000,000. As these surveys have not yet been completed, the cost of the program is not included in the "shelf" of projects in Table III.

It is likely, however, that these surveys, as well as those undertaken for "regular" reclamation projects, will result in recommendations in the next year or two for a large program of future works for the development of the land and water resources of the Western States.

#### **Bureau of Indian Affairs**

Surveys being carried on by the Bureau of Indian Affairs consist of investigations for irrigation, flood control, and incidental power production on Indian lands in the West. During the current year, three important surveys involving construction of dams for irrigation, flood control, and power, have been completed. These include the Klickitat Dam and Reservoir of the Wapato Indian Irrigation project on the Yakima Reservation, Wash., the Buttes Dam and Reservoir of the San Carlos project, Arizona, and the White Narrows project, Moapa Indian Reservation, Nev. A survey involving irrigation of Indian-owned lands along the Grand River, S. Dak., was discontinued during the year, as the Bureau of Reclamation is conducting a study of this area. In addition to the surveys completed or discontinued, the Bureau is conducting an investigation for possible irrigation developments on lands along the Mancos River, Colo.

Projects recommended by surveys completed during the year are included in the "shelf" of projects for future construction as summarized in Table III. The

estimated cost of the projects involved in the surveys is greater than \$30,000,000.

#### **National Park Service**

The Department of the Interior Appropriation Act of 1942 appropriated \$27,000 to the National Park Service for conduct of a survey of the recreational resources and possibilities of the Denison Dam and Reservoir project in Texas and Oklahoma. The survey is being carried on as a part of the program of the National Park Service in preparing a Nation-wide plan for park, parkway, and recreational area improvements, as authorized in the Park, Parkway and Recreation Study Act of June 23, 1936.

#### **Department of State**

##### **International Boundary Commission, United States and Mexico**

The Commission conducts surveys along the United States-Mexico border involving irrigation, water conservation, and flood control projects which require cooperation between the two nations. During the past year, a survey of the Douglas Sanitation project, Arizona, has been completed and recommendation has been made for construction to cost \$90,000. In addition, a portion of the survey of the Rio Grande River has been completed, and recommendations have been submitted for construction of the Valley Gravity Canal and Storage project for irrigation. Similar projects may be recommended in the future as a result of the continuation of this survey.

In addition to those surveys which have been completed, an investigation is now under way for a proposed fence along the Texas-Mexico border.

#### **War Department**

##### **Corps of Engineers**

Surveys conducted by the Corps of Engineers include investigations of river and harbor and flood control improvements in practically all sections of the country. In point of number of surveys undertaken and volume of construction involved in such surveys, the Corps of Engineers leads all the construction agencies (Class I) engaged in surveying projects leading to construction. For many years investigations under jurisdiction of the Engineers were restricted to river and harbor projects, with the exception of flood control in the Alluvial Valley of the Mississippi, and certain other special cases. The Flood Control Act of June 22, 1936, marked a change in the policy of the Federal Government with respect to flood control in general, and since

passage of the Act a substantial proportion of the survey and construction activities of the Engineers has been directed to alleviation of flood control problems throughout the country.

Of the surveys completed during the year, a number formed the basis for projects authorized in the Flood Control Act of August 18, 1941. Other surveys resulted in projects which were recommended for construction by the Corps of Engineers but were not included in the Flood Control Act, either because the Congress did not consider the projects sufficiently important to be authorized at this time or because the surveys were not completed in time for inclusion of the projects in the Act. Not all of the projects authorized in the Act will be constructed in the near future. Those which have no direct relation to national defense are to be deferred for construction in the post-war period.

A large number of surveys completed during 1941 have resulted in recommendations for river and harbor projects included in the Omnibus River and Harbor Bill now pending before Congress. Although some of these projects have definite defense value, a large proportion of them are being considered for authorization so that plans and specifications can be made for their construction in the post-war period. Upon authorization, these projects will form a substantial part of the reservoir of post-war construction projects.

The more important surveys completed by the Corps of Engineers during the year include those for the further comprehensive development of the Connecticut River Basin for flood control and power, the Housatonic River survey for flood control, the survey for a comprehensive flood control, navigation, and power project in the Trinity River Basin, Tex., and survey of the flood control project on the Sacramento River and tributaries, California. Important river and harbor investigations include surveys of the Delaware River at Camden, N. J., the Great Lakes Ship Channels, the Louisiana-Texas Intracoastal Waterway, San Diego, Los Angeles, and Long Beach Harbors, Calif., and Honolulu Harbor, T. H. Investigations of power projects completed during the year include the survey of the power plant at Sault Ste. Marie, Mich., and a survey for provision of additional power facilities at Norfolk Dam on the White River in Arkansas.

It must be remembered that the surveys listed in Table II as being completed during the year include only those completed with favorable reports, and that

many others with unfavorable reports were completed during the year but are not listed in the table.

Of the surveys under way as of December 1, 1941, Table II lists only those which have been reported under Executive Order No. 8455. Prior to the issuance of the Executive Order on June 26, 1940, all flood control surveys conducted by the Corps of Engineers were reported to the Board under provisions set forth in Circular No. 338, issued by the Bureau of the Budget on May 14, 1936. The process of incorporating these surveys into the more detailed reporting system now in use under Executive Order No. 8455 has not been completed; there are, therefore, many surveys under way in addition to those listed in Table II. In addition, a number of preliminary examinations are being carried on by the Corps of Engineers, but these are not listed in the table because such preliminary examinations are not reported to the Board under Executive Order No. 8455.

Of the surveys under way as of December 1, 1941, some of them were necessitated by national defense requirements and others were a part of the routine investigation program of the Corps of Engineers. Not all of the surveys under way will result in recommendations for construction projects, as many will result in reports unfavorable to construction. It is expected that, with the exception of strictly defense projects, most of the projects growing out of surveys under way will become a portion of the reservoir of public works suitable for construction in the post-war period.

Included in the large number of investigations now under way are flood control surveys specifically authorized by the Flood Control Act of August 18, 1941, and by Congressional committee resolutions. In addition, authorization for 183 river and harbor surveys is pending in the rivers and harbors bill now before Congress.

In the conduct of all surveys which involve the interests or operations of other Federal agencies, the Corps of Engineers cooperates with such agencies in the exchange of data and findings. In the field of flood control the Corps cooperates with the Department of Agriculture as directed by the policy first laid down in the 1936 Flood Control Act. The Federal Power Commission is consulted on the power aspects of flood control, navigation, and multiple purpose reservoirs, and the Bureau of Reclamation is consulted on projects under survey in the Western States where irrigation is likely to be an important factor.

## FEDERAL 6-YEAR PROGRAM OF PUBLIC WORKS

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>FEDERAL POWER COMMISSION</b>				
S-1601-2-3.....	Survey of Contoocook River multiple-purpose development, Contoocook River, N. H., involving consideration of a comprehensive plan for the development of the Contoocook River for flood protection in the Centeeceek and Merrimack River Valleys, for stream flow regulation, improvement of sanitary conditions, hydroelectric power generation, and increased recreation facilities. Purpose of the survey is to develop a plan of coordinated operation of a system of reservoirs on the Contoocook River in conjunction with others proposed or existing in the Merrimack River basin <sup>1</sup> for the maximum benefits from the water resources of both rivers.	To be determined by survey.	October 1938.....	Under way.
S-1601-26-2.....	Survey of Alabama-Coosa River multiple-purpose development, <sup>2</sup> Mobile River Basin, Ala. and Ga., involving a determination of a comprehensive plan for the development of the Alabama-Coosa branch of the Mobile River system for navigation, power development, and flood control. The investigation is based upon the interim report of the Chief of Engineers and the results of field and office studies made in cooperation with the War Department. The purpose is to determine the most suitable plan for development of the Alabama-Coosa River for the generation of power in conjunction with flood control and navigation and for the benefit of existing power developments; and to establish the order of priority of projects, considering national defense needs and the relation of power projects on the Alabama-Coosa River to those on adjacent rivers.	.....do.....	October 1941.....	Do.
S-1601-32-1.....	Survey of Wolf Creek Dam and Reservoir, Cumberland River, Ky. The project is now under construction by the War Department for flood control and power development. <sup>3</sup> If the dam is built to the height now contemplated, and if 37-foot crest gates are added, as proposed when power generating facilities are installed, a reservoir having a gross storage capacity of 5,782,000 acre-feet would be created. Of this capacity, 1,895,000 acre-feet would be utilized for flood control, and 2,017,000 acre-feet for stream flow regulation, leaving 1,870,000 acre-feet of dead storage to provide power head. Provision is being made for eventual installation of 6 generating units, with capacity aggregating 250,000 kw. at normal head and 180,000 kw. at minimum head. The Commission has recommended that power generating facilities be installed with a capacity of 125,000 kw. at normal head and made ready for operation in 1946. Estimated cost includes power generating facilities for 125,000 kw.	\$52,500,000.....	August 1940.....	November 1941.
S-1601-33-2.....	Survey of Cheat River multiple-purpose development, upper Ohio River Basin, W. Va., involving consideration of the proposed projects and existing developments to determine a comprehensive plan for multiple-purpose development of the Cheat River for flood control and power, with navigation, pollution abatement, and recreational benefits. The study is in cooperation with the War Department <sup>4</sup> and in connection with plans for flood control above Pittsburgh.	To be determined by survey.	May 1939.....	Under way.
S-1601-33-3.....	Survey of Clarion River multiple-purpose development, upper Ohio River Basin, Pa., involving consideration of proposed projects and existing developments to determine a comprehensive plan for multiple-purpose development of the Clarion River for flood control and power, with incidental navigation and pollution abatement benefits. The study is in cooperation with the War Department <sup>4</sup> and in connection with plans for flood control above Pittsburgh.	.....do.....	.....do.....	Do.
S-1601-33-7.....	Survey of Youghiogheny River multiple-purpose development, Youghiogheny River Basin, Pa. and Md., involving a study of the Youghiogheny Reservoir Project, now under construction by the War Department, <sup>5</sup> and its relation to a comprehensive plan of development of the Youghiogheny River Basin. The purpose is to determine the most suitable plan for development of the Youghiogheny River as a whole for the production of power in conjunction with flood control and allied benefits; how power at the Youghiogheny project may be used to best advantage in combination with other hydroelectric projects in the basin; and how a power system in the basin may be operated in conjunction with power systems on the Cheat and Clarion Rivers; and to make recommendations with respect to the installation of penstocks or related facilities for the possible future generation of power at the Youghiogheny reservoir project.	.....do.....	January 1940.....	Do.

<sup>1</sup> Flood control reservoir system for the Merrimack Basin was authorized by the Flood Control Act of June 22, 1936, Public Law 738, 74th Cong.<sup>2</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, upon the basis of H. Doc. 414, 77th Cong.<sup>3</sup> Development authorized by Flood Control Act of June 22, 1936, Public Law 738, 74th Cong., upon the basis of H. Dec. 306, 74th Cong.; Flood Control Act of June 28, 1938, Public Law 761, 75th Cong., upon the basis of Flood Control Committee, Dec. 1, 75th Cong.<sup>4</sup> Corps of Engineers survey, Docket No. S-302-33-10.<sup>5</sup> Corps of Engineers survey, Docket No. S-302-33-11.<sup>6</sup> Project authorized by the Flood Control Act of June 22, 1936, Public Law 738, 74th Cong., upon the basis of H. Doc. 306, 74th Cong., and Flood Control Act of 1938, Public Law 761, 75th Cong., upon the basis of Flood Control Committee Dec. 1, 75th Cong.



TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>FEDERAL POWER COMMISSION—Continued</b>				
S-1601-35-1.....	Survey of Bluestone Reservoir project, New River, W. Va. and Va., involving a study of the flood control and power project now under construction by the War Department. <sup>7</sup> The Commission has recommended that provisions be made for the development of power at Bluestone Reservoir with an initial installation of 60,000 kw., to be ready for operation by 1943. The Commission further recommended that an afterbay dam be built as a part of the project to re-regulate the flow from the Bluestone Reservoir, with provision in the afterbay dam for the future development of power. The estimated cost includes cost of Bluestone dam, power plant, and re-regulating reservoir.	\$22,543,000.....	September 1938...	October 1941.
S-1601-62-1.....	Survey of Coralville Reservoir project, Iowa River, Iowa, involving a study of the War Department report on the Coralville Reservoir flood control project. <sup>8</sup> Purpose of the survey is to determine the desirability of and to make recommendations with respect to the installation of penstocks or related facilities for the possible future generation of hydroelectric power at the project.	To be determined by survey.	July 1940.....	Under way.
S-1601-82-1.....	Survey of Norfolk Dam and Reservoir Project, North Fork River, White River Basin, Ark. and Mo., now under construction by the Corps of Engineers, for flood control and future power development. <sup>9</sup> As constructed initially, the dam will be a concrete-gravity structure with a maximum height of 231 feet, a length of 2,640 feet, and a 600-foot uncontrolled spillway. The maximum uncontrolled flood discharge rate is expected to be 40,000 cubic feet per second, and the channel capacity is about 60,000 cubic feet per second. The storage capacity below the crest of the ungated spillway will be 1,251,000 acre-feet. Provision will be made for the future installation of crest gates which will increase the controlled storage capacity of the reservoir to 1,983,000 acre-feet. When power facilities are installed, 732,000 acre-feet of capacity will be reserved for flood control and 1,251,000 acre-feet will be utilized for the regulation of stream flow and for dead storage to provide head for the development of power. The Commission concurred in the recommendations of the War Department that the Norfolk project be constructed initially for the dual purposes of flood control and power, the initial installation to be 60,000 kw. Cost includes power allocation only.	\$12,650,000.....	March 1941.....	April 1941.
S-1601-83-2.....	Survey of Markham Ferry Reservoir project, Grand (Neosho) River, Okla., involving a study of the War Department's report on Pensacola, Markham Ferry, and Fort Gibson Reservoir sites on the Grand (Neosho) River. <sup>10</sup> The project will be considered in relation to proposed plans for a comprehensive system of multiple-purpose reservoirs in the Arkansas River Basin, and with respect to existing projects and water uses. Purpose of the survey is to determine whether the Markham Ferry Reservoir project would be a component part of a comprehensive plan to develop the water resources of the Arkansas River, and to make recommendations with respect thereto, particularly with respect to the power features of the project.	To be determined by survey.	December 1940....	Under way.
S-1601-83-3.....	Survey of Fort Gibson Reservoir project, Grand (Neosho) River, Okla., involving a study of the War Department's report on Pensacola, Markham Ferry, and Fort Gibson Reservoir sites on the Grand (Neosho) River. <sup>11</sup> The project will be considered in relation to proposed plans for a comprehensive system of multiple-purpose reservoirs in the Arkansas River Basin, and with respect to existing projects and water uses. Purpose of the survey is to determine whether the Fort Gibson Reservoir project would be a component part of a comprehensive plan to develop the water resources of the Arkansas River, and to make recommendations with respect thereto, particularly with respect to the power features of the project.	...do.....	...do.....	Do.
S-1601-83-4.....	Survey of Tenkiller Ferry Reservoir project, <sup>12</sup> Illinois River, Arkansas River Basin, Okla., involving a study of the War Department report. Purpose of the survey is to determine whether the proposed Tenkiller Ferry Reservoir project would be a component part of a comprehensive plan to develop the water resources of the Arkansas River, and to make recommendations with respect thereto, particularly with respect to the power features of the project.	...do.....	July 1941.....	Do.
S-1601-84-1.....	Survey of Wister Reservoir project, <sup>13</sup> Poteau River, Arkansas River Basin, Okla., involving a study of the War Department report. Purpose of the survey is to determine whether the proposed Wister Reservoir project would be a component part of a comprehensive plan to develop the water resources of the Arkansas River, and to make recommendations with respect thereto, particularly with respect to the power features of the project.	...do.....	...do.....	Do.
S-1601-96-2.....	Survey of Brazos River Power projects, Brazos River, Tex., involving a study of the power possibilities of the Brazos River below the Possum Kingdom project. The office study is supplemented by field investigations, and by data furnished by the War Department. Purpose of the survey is to determine the power potentialities of the Brazos River, the economic and engineering feasibility of hydroelectric power development at sites suggested by the Brazos River Conservation and Reclamation Association, and the relation of these proposed developments to comprehensive plans for development of the Brazos River.	...do.....	June 1941.....	Do.

<sup>7</sup> Project authorized by the Flood Control Act of June 22, 1936, Public Law 738, 74th Cong., upon the basis of H. Doc. 306, 74th Cong.; and Flood Control Act of 1933, Public Law 761, 75th Cong., upon the basis of Flood Control Committee Doc. 1, 75th Cong.

<sup>8</sup> Project authorized by the Flood Control Act of June 28, 1938, Public Law 761, 76th Cong.

<sup>9</sup> Project authorized by the Flood Control Act of June 22, 1936, Public Law 738, 74th Cong.; the Flood Control Act of June 28, 1938, Public Law 761, 75th Cong.; and the Flood Control Act of August 18, 1941, Public Law 228, 77th Cong.

<sup>10</sup> Project authorized by the Flood Control Act of August 18, 1941, Public Law 228, 77th Cong., on the basis of H. Doc. 107, 76th Cong.

<sup>11</sup> Project authorized by the Flood Control Act of August 18, 1941, Public Law 228, 77th Cong., on the basis of H. Doc. 107, 76th Cong.

<sup>12</sup> Project authorized by the Flood Control Act of June 28, 1938, Public Law 761, 75th Cong., upon the basis of Flood Control Committee Doc. 1, 75th Cong.

<sup>13</sup> Project authorized by the Flood Control Act of June 28, 1938, Public Law 761, 75th Cong., upon the basis of Flood Control Committee Doc. 1, 75th Cong.



TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>FEDERAL POWER COMMISSION—Continued</b>				
S-1601-111-1....	Survey of Hungry Horse Reservoir project, South Fork of Flathead River, Mont., involving a study of the report of the War Department. In a letter to the Chief of Engineers, War Department, the Commission stated that early initiation of the Hungry Horse project appeared desirable from the standpoint of national defense. The possibility of future diversion of the Middle Fork of the Flathead River into Hungry Horse Reservoir was suggested. Estimated cost includes power facilities.	\$40,000,000.....	June 1941.....	August 1941.
S-1601-113-1....	Survey of Detroit Dam and Reservoir, <sup>14</sup> North Santiam River, Willamette River Basin, Oreg., involving a review of the War Department report on the comprehensive plan for flood control and water utilization of the Willamette Basin, and the relation of the Detroit project to existing and proposed projects on the Santiam and other rivers of the basin for flood control, power development, navigation, irrigation, and pollution abatement. The survey will determine the desirability of penstocks or related facilities for the possible future generation of hydroelectric power at the Detroit Dam and Reservoir project, and will make recommendations with respect to their installation.	To be determined by survey.	October 1940.....	Under way.
S-1601-114-1....	Survey of Mud Mountain Reservoir project, White River, Wash., now under construction by the War Department. <sup>15</sup> The Commission recommended that provisions for the future generation of power be incorporated in the initial construction of the dam. The War Department indicated that the outlet tunnel could be utilized for power without change of construction plans.	No additional cost involved.	April 1939.....	December 1940.
<b>TENNESSEE VALLEY AUTHORITY</b>				
S-2100-31-1....	Survey of Upper French Broad Valley, Tenn., and N. C., including a study of magnitude and frequency of past floods and flood damage, an estimate of floods to be expected in the future, and a suggested plan and estimate of cost for flood prevention, to determine what construction, such as a reservoir, levees, or other means, might be feasible to alleviate floods.	To be determined by survey.	March 1941.....	Under way.
S-2100-31-2....	Survey of hydroelectric power possibilities for the Upper Tennessee Basin, including study of the hydroelectric possibilities and potentialities of some of the upper tributaries of the Tennessee, particularly of the Holston, French Broad, Hiwassee, and Little Tennessee Rivers. Purpose of the study is to determine what reservoirs may be constructed on the upper tributaries to augment the existing Tennessee River system by additional storage reservoirs and hydroelectric plants.	.....do.....	1934.....	Partially completed; remainder under way.
S-2100-31-3....	Survey of requirements and planning of physical service facilities required for continuing activities of the Tennessee Valley Authority. A part of this survey has been completed to the extent that a general plan for the coordinated development of service facilities for Reservation No. 2, Wilson Dam, Ala., has been prepared. The general plan calls for purchase of additional land for service facilities and protective purposes, development of main road system, chemical plant area, and fleet harbor area, relocation and extension of railroad system, and construction of garage and office building. Estimated cost includes Wilson Dam service facilities.	\$7,700,000.....	June 1941.....	Partially completed October 1941.
S-2100-31-6....	Survey of extent of flood hazards in towns and cities in the Tennessee River Basin, with consideration of feasibility of flood control or protection works.	To be determined by survey.	May 1940.....	Under way
S-2100-31-7....	Survey of Hales Bar project on the Tennessee River, Tenn., to determine the manner of providing 9-foot navigation from Hales Bar Dam to Chickamauga Dam; the method of repairing dam to prevent leakage; the repairs and improvements necessary for the existing lock and provisions required for future lock; desirability of modernization of present hydro station, and provisions necessary for ultimate installation.	.....do.....		Do.
S-2100-31-8....	Survey of Great Falls Reservoir on Caney Fork River, Tenn., to determine amount and locations of leakage, possible remedial measures, and their economic feasibility.	.....do.....	August 1939.....	Do.
<b>DEPARTMENT OF AGRICULTURE</b>				
<b>Flood Control Surveys</b>				
S-809-2-1.....	Survey of Merrimack River watershed, New Hampshire and Massachusetts, with intensive investigations of flood and silt source areas, to determine the feasibility of a program for run-off and water flow retardation and soil erosion prevention in the interest of flood control.	.....do.....	August 1938.....	Do.
S-809-5-1.....	Survey of Connecticut River watershed, Vermont and New Hampshire, with intensive investigations of flood and silt source areas, to determine the feasibility of a program for run-off and water flow retardation and soil erosion prevention in the interest of flood control.	.....do.....	November 1939....	Do.
S-809-9-2.....	Survey of the watershed of the Susquehanna River and tributaries above Towanda, Pa., and east of the confluence of the Chemung River, involving a study of land use and management, and flood and sedimentation damages on the watersheds and flood plains of the tributaries. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watersheds.	.....do.....	September 1939....	Do.
S-809-11-1.....	Survey of the Potomac River watershed, Virginia, Maryland, and West Virginia, with intensive investigations of flood and silt source areas, to determine the feasibility of a program for run-off and water flow retardation and soil erosion prevention in the interest of flood control.	.....do.....	October 1939.....	Do.

<sup>14</sup> Project authorized by the Flood Control Act of June 28, 1938, Public Law 761, 75th Cong., on the basis of H. Doc. 544, 75th Cong.; Flood Control Act of Aug. 18, 1941, Public Law 228, 77th Cong.<sup>15</sup> Project authorized by the Flood Control Act of 1936, Public Law 733, 74th Cong.

TABLE II.—*Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued*

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Data completed
<b>DEPARTMENT OF AGRICULTURE—Continued</b>				
<b>Flood Control Surveys—Continued</b>				
S-809-17-1.....	Survey of Pee Dee River in North Carolina, South Carolina, and Virginia, involving a study of land use and management, and flood and sedimentation damages on the watersheds and flood plains of the tributaries. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and improve the economic status of persons in the watersheds.	To be determined by survey.	October 1939.....	Under way.
S-809-26-1.....	Survey of the Coosa River watershed, Alabama and Georgia, involving a study of land use and management on the watershed, and flood and sedimentation damages on the flood plains in the city of Rome, Ga., and to proposed and existing flood-control and domestic-usereservoirs. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watersheds.	.....do.....	September 1938....	Do.
S-809-33-1.....	Survey of the Youghiogheny River watershed, Pennsylvania and Maryland, involving a study of land use and management, and flood and sedimentation damages on the watersheds and flood plains of the tributaries. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and improve the economic status of persons in the watershed.	.....do.....	August 1938.....	Do.
S-809-36-1.....	Survey of Muskingum River watershed in Ohio, involving a study of land use and management, and flood and sedimentation damages on the watersheds and flood plains of the tributaries. Included is a study of the feasibility of remedial measures by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	.....do.....	.....do.....	Do.
S-809-47-1.....	Survey of Buffalo Creek watershed, New York, involving a study of flood and silt source areas, to determine the feasibility of a program of water flow retardation and erosion prevention in aid of flood control. Included is an appraisal of the nature and extent of damage from flood, erosion, and sediment.	.....do.....	.....do.....	Do.
S-809-55-1.....	Survey of Whitewater River watershed, Minnesota, involving a study of land use and management, and flood and sedimentation damages on the watersheds and flood plains of the tributaries. Included is a study of the feasibility of remedial measures by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	.....do.....	September 1939....	Do.
S-809-58-1.....	Survey of Kikapoo River watershed, Wisconsin, with intensive investigations of flood and silt source areas, to determine the feasibility of a program for run-off and water flow retardation and soil erosion prevention in the interest of the flood control.	.....do.....	August 1938.....	Do.
S-809-67-1.....	Survey of the watershed of Alkali Cove, Canyon and Valley Creeks, tributaries of the Yellowstone River near Billings, Mont., involving a study of land use and management on farm and ranch lands of the watershed, and flood and sedimentation damage on flood plains thereof. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, and to reduce flood and sedimentation damages.	.....do.....	July 1941.....	Do.
S-809-71-1.....	Survey of the Little Sioux River watershed, Minnesota and Iowa, involving a study of land use and management, and flood and sedimentation damages on the flood plains and to the existing drainage system adjacent to the Missouri River bottomlands. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	.....do.....	May 1940.....	Do.
S-809-72-1.....	Survey of Cherry Creek watershed, Colorado, involving a study of land use and management on farm and ranch lands of the watershed, and flood and sedimentation damage on flood plains thereof. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	.....do.....	June 1939.....	Do.
S-809-78-1.....	Survey of Fountain Creek watershed, Colorado, involving a study of land use and management of farm and ranch lands of the watershed, and flood and sedimentation damage on flood plains thereof. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	.....do.....	August 1938.....	Do.
S-809-79-1.....	Survey of the Salt Fork River watershed, Oklahoma, involving a study of land use and management on farm and ranch lands of the watershed, and flood and sedimentation damage on the flood plains thereof. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	.....do.....	June 1940.....	Do.
S-809-81-1.....	Survey of Wolf Creek watershed, Texas and Oklahoma, involving a study of land use and management of farm and ranch lands of the watershed, and flood and sedimentation damage on the flood plains thereof. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	.....do.....	November 1939....	Do.
S-809-82-1.....	Survey of White River watershed above Norfolk Reservoir, Arkansas and Missouri, with intensive investigations of flood and silt source areas, to determine the feasibility of a program for run-off and water-flow retardation and soil-erosion prevention in the interest of flood control.	.....do.....	April 1940.....	Do.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF AGRICULTURE—Continued</b>				
<b>Flood Control Surveys—Continued</b>				
S-809-82-2.....	Survey of St. Francis River watershed above Wappapello Dam, Mo., with intensive investigations of flood and silt source areas, to determine the feasibility of a program for run-off and water-flow retardation and soil erosion prevention in the interest of flood control.	To be determined by survey.	July 1938.....	Under way.
S-809-83-1.....	Survey of the Grand (Neosho) River watershed, Kansas, Oklahoma, Missouri, and Arkansas, involving a study of land use and management and flood and sedimentation damages on the watersheds and flood plains of the tributaries. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	do .....	September 1939...	Do.
S-809-84-1.....	Survey of the watersheds of the Fourche LaFave and Petit Jean Rivers, tributaries of the Arkansas River in Arkansas, involving a study of land use and management, and flood and sedimentation damages on the watersheds and flood plains of the tributaries. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	do .....	February 1940....	Do.
S-809-86-1.....	Survey of the Washita River watershed, Colorado and Texas, involving a study of land use and management, and flood and sedimentation damages on the watersheds and flood plains of the tributaries. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	do .....	August 1938.....	Do.
S-809-91-1.....	Survey of Yazoo River watershed, Mississippi and Tennessee, with intensive investigations of flood and silt source areas, to determine the feasibility of a program for run-off and water-flow retardation and soil-erosion prevention in the interest of flood control.	do .....	October 1939.....	Do.
S-809-91-2.....	Survey of Little Tallahatchie River watershed above Sardis Reservoir, Miss., with intensive investigations of flood and silt source areas, to determine the feasibility of a program of run-off and water-flow retardation and soil-erosion prevention in the interest of flood control.	do .....	September 1938...	Do.
S-809-95-1.....	Survey of Trinity River, Texas. The plan proposed by the Department of Agriculture as a result of the survey provides for retardation of water flow and prevention of erosion through: (1) Treatment of the cultivated lands, pastures, and woodlands to reduce soil and water losses. (2) Conversion of eroded lands to pasture, meadow, and woodland. (3) Public purchase and treatment of land in critical areas. (4) Installation of adequate fire control to prevent continued denuding of portions of the watershed. A 15-year program of water-flow retardation and soil-erosion prevention is recommended.	\$32,000,000.....	June 1938.....	February 1941.
S-809-97-1.....	Survey of Concho River watershed, Texas, involving a study of land use and management on farm and ranch lands of the watershed, and flood and sedimentation damage on the flood plains thereof. Included is a study of the feasibility of remedial measures by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	To be determined by survey.	October 1938.....	Under way.
S-809-97-2.....	Survey of the Middle Colorado River, a tributary, and the main stem of the Colorado River in Texas from Paint Rock to the Marshall Ford Dam, involving a study of land use and management on farm and ranch lands of the watershed, and flood and sedimentation damage on flood plains thereof. Included is a study of the feasibility of remedial measures by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	do .....	April 1940.....	Do.
S-809-100-1.....	Survey of Pecos River watershed, Texas and New Mexico, involving a study of land use and management, and flood and sedimentation damages on the watersheds and flood plains of the tributaries. Included is a study of the feasibility of remedial measures by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watersheds.	do .....	August 1939.....	Do.
S-809-101-1.....	Survey of the Rio Puerco watershed, New Mexico, involving a study of the use and condition of range and other lands, and flood and sedimentation damages in the watershed and in the Rio Grande Valley between the mouth of the Rio Puerco and the Elephant Butte Reservoir. Included is a determination of the feasibility of remedial programs of land use adjustment and debris basins and channel barriers.	do .....	January 1939.....	Do.
S-809-103-1.....	Survey of the Queen Creek watershed in the Gila River Basin, Ariz., involving a study of land use and management on the range lands, and flood and sediment damages on the flood plains of the watershed. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	do .....	August 1938.....	Do.
S-809-103-2.....	Survey of Gila River watershed, Arizona and New Mexico, involving a study of land use and management, and flood and sedimentation damages on the flood plain of the river. Included is a study of the feasibility of the application of land use adjustment and structural treatment to reduce debris damage to irrigated land and irrigation works.	do .....	October 1938.....	Do.
S-809-104-1.....	Survey of Sevier River watershed, Utah, with intensive investigations of flood and silt source areas, to determine the feasibility of a program for run-off and water flow retardation and soil erosion prevention in the interest of flood control.	do .....	March 1940.....	Do.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF AGRICULTURE—Continued</b>				
<b>Flood Control Surveys—Continued</b>				
S-809-107-1.....	Survey of Pajaro River watershed, California, involving a study of land use and management, and flood and sedimentation damages on the watersheds and flood plains of the tributaries. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	To be determined by survey.	January 1940.....	Under way
S-809-108-1.....	Survey of San Gabriel River watershed, California, with intensive investigations of flood and silt source areas, to determine the feasibility of a program for run-off and water flow retardation and soil erosion prevention in the interest of flood control.	.....do.....	July 1938.....	Do.
S-809-108-2.....	Survey of Santa Maria River watershed, California, with intensive investigations of flood and silt source areas, to determine the feasibility of a program for run-off and water flow retardation and soil erosion prevention in the interest of flood control.	.....do.....	November 1940....	Do.
S-809-108-3.....	Survey of the Santa Ana River watershed, California, involving a study of land use and management and flood and debris damage in the watershed, as well as the feasibility of remedial land management programs and structural treatment in alleviating flood and debris damage.	.....do.....	July 1940.....	Do.
S-809-110-1.....	Survey of Boise River watershed, Idaho, with intensive investigations of flood and silt source areas, to determine the feasibility of a program for run-off and water flow retardation and soil erosion prevention in the interest of flood control.	.....do.....	August 1938.....	Do.
S-809-112-1.....	Survey of the Walla Walla River watershed, Washington, involving a study of land use and management, and flood and sedimentation damages on the watersheds and flood plains of the tributaries. Included is a study of the feasibility of remedial programs by the Department of Agriculture to correct watershed problems, to reduce flood and sedimentation damages, and to improve the economic status of persons in the watershed.	.....do.....	March 1940.....	Do.
<b>Water Facilities Surveys</b>				
The following are surveys of individual watersheds or portions of watersheds for area planning under the Water Facilities Act. The surveys involve determination of present land and water uses, availability of water supplies, and general economic conditions in the areas; recommendations are made for the better use of existing land and water resources, and for the construction of such water facilities as small reservoirs, stock ponds, and canals. Area plans are prepared by the Bureau of Agricultural Economics, for approval of the Water Facilities Board, under procedures set forth in the "Water Facilities Procedure Manual," and the "Water Facilities Area Planning Handbook." Approved area plans are made the basis for operations projects planned by the Soil Conservation Service, and carried out by the Service in cooperation with the Farm Security Administration and local interests:				
S-813-66-1.....	Survey of balance of Teton River watershed, Teton and Choteau Counties, Mont.....	.....do.....	May 1939.....	Do.
S-813-66-2.....	Survey of Shotgun and Clover Creeks, Richland County, Mont.....	.....do.....	October 1940.....	Do.
S-813-66-3.....	Survey of Big Muddy River, Sheridan, Daniels, and Roosevelt Counties, Mont.....	.....do.....	.....do.....	Do.
S-813-66-4.....	Survey of Pipestone Creek, Jefferson County, Mont.....	.....do.....	.....do.....	Do.
S-813-67-1.....	Survey of balance of Little Powder River, Campbell County, Wyo.....	.....do.....	September 1938....	Do.
S-813-67-2.....	Survey of Crazy Woman Creek watershed, Johnson County, Wyo. Survey completed by the Bureau of Agricultural Economics and area plan approved by the Water Facilities Board.	.....do.....	November 1939....	May 1941.
S-813-67-5.....	Survey of Shell Creek watershed, Big Horn County, Wyo.....	.....do.....	.....do.....	Under way.
S-813-67-6.....	Survey of Nowood Creek watershed, Big Horn and Washakie Counties, Wyo.....	.....do.....	March 1941.....	Do.
S-813-68-1.....	Survey of the balance of Heart River watershed, Morton and Grant Counties, N. Dak.....	.....do.....	August 1938.....	Do.
S-813-68-2.....	Survey of the balance of the Moreau River watershed, Harding, Perkins, Butte, Meade, Ziebach, and Dewey Counties, S. Dak.....	.....do.....	May 1939.....	Do.
S-813-68-3.....	Survey of Oak Creek watershed, Corson County, S. Dak., and Slouss County, N. Dak.....	.....do.....	.....do.....	Do.
S-813-69-1.....	Survey of Cherry-Sulphur Creek (Subarea II) watershed, S. Dak. Survey completed by the Bureau of Agricultural Economics and area plan approved by the Water Facilities Board.	\$20,620.....	September 1938....	June 1941.
S-813-69-2.....	Survey of Whitewood Creek watershed, Butte and Lawrence Counties, S. Dak.....	To be determined by survey.	May 1939.....	Under way.
S-813-69-3.....	Survey of the balance of Hat Creek watershed, Fall River County, S. Dak., and Slouss County, Nebr.....	.....do.....	September 1939....	Do.
S-813-69-5.....	Survey of the Custer Area in Custer, Pennington, and Fall River Counties, S. Dak.....	.....do.....	April 1941.....	Do.
S-813-70-1.....	Survey of Bad River watershed, Haakon, Stanley, Jackson, and Jones Counties, S. Dak.....	.....do.....	May 1939.....	Do.
S-813-70-2.....	Survey of Niobrara River watershed, Nebraska, South Dakota, and Wyoming, for area planning under the Water Facilities Act. Area plan for subarea I, consisting of parts of Niobrara and Goshen Counties, Wyo., and Slouss, Dawes, Box Butte, and Sheridan Counties in Nebr., prepared by the Bureau of Agricultural Economics and approved by the Water Facilities Board.	.....do.....	September 1938....	February 1941.
S-813-72-1.....	Survey of El Paso and Elbert Counties, Colo.....	To be determined by survey.	February 1940.....	Under way.
S-813-73-2.....	Survey of the South Fork of the Solomon River watershed, Sheridan and Thomas Counties, Kans.....	.....do.....	September 1938....	Do.
S-813-73-3.....	Survey of the North Fork of the Solomon River watershed, Kans.....	.....do.....	January 1941.....	Do.
S-813-73-8.....	Survey of the Upper Republican Basin in Nebraska, Kansas, and Colorado. Survey completed by the Bureau of Agricultural Economics and area plan approved by the Water Facilities Board.	.....do.....	October 1938.....	June 1941.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF AGRICULTURE—Continued</b>				
<b>Water Facilities Surveys—Continued</b>				
S-813-78-1	Survey of Fountain Creek watershed, El Paso, Pueblo, Teller, and Douglas Counties, Colo.	To be determined by survey.	February 1939	Under way.
S-813-78-2	Survey of Walnut Creek watershed, Barton and Rush Counties, Kans.	do.	September 1938	Do.
S-813-78-3	Survey of Pawnee River watershed, Kans.	do.	February 1939	Do.
S-813-78-4	Survey of Chalk Creek drainage basin in Chaffee County, Colo.	do.	May 1941	Do.
S-812-80-1	Survey of Crooked Creek watershed, Meade, Gray, and Haskell Counties, Kans.	do.	July 1939	Do.
S-813-80-2	Survey of Dry Cimarron watershed, Colfax and Union Counties, N. Mex., Las Animas and Baca Counties, Colo., and Cimarron County, Okla.	do.	February 1939	Do.
S-813-81-1	Survey of Mora River watershed, Mora, San Miguel, and Colfax Counties, N. Mex.	do.	May 1939	Do.
S-813-81-2	Survey of the Ocate River watershed in Mora and Colfax Counties, N. Mex. Survey completed by the Bureau of Agricultural Economics and area plan approved by the Water Facilities Board.	Estimated direct Federal cost \$4,700.	July 1939	December 1940.
S-813-81-3	Surveys of the Quay-Curry Extension, Quay and Curry Counties, N. Mex.	To be determined by survey.	December 1939	Under way.
S-813-81-4	Survey of the balance of the New Mexico-Texas Rita Blanca watershed, Union, Harding, and Colfax Counties, N. Mex.	do.	September 1938	Do.
S-813-81-5	Survey of the tributaries to the North Fork Canadian River in Cimarron and Texas Counties, Okla.	do.	May 1941	Do.
S-813-85-1	Survey of Cache Creek watershed, Oklahoma	do.	July 1939	Do.
S-813-85-2	Survey of Pease River watershed, Texas	do.	September 1938	Do.
S-813-85-3	Survey of Oklahoma-Texas Salt Fork of Red River watershed, Collingsworth, Donley, Armstrong, and Carson Counties, Tex.	do.	do.	Do.
S-813-96-1	Survey of Dockum, Duck, and Croton Creeks watershed, Dickens and Kent Counties, Tex.	do.	January 1939	Do.
S-813-101-2	Survey of Espanola Valley, Taos, Rio Arriba, and Santa Fe Counties, N. Mex.	do.	October 1940	Do.
S-813-101-3	Survey of the western slope of the Sangre de Cristo Mountains, Taos and Rio Arriba Counties, N. Mex.	do.	January 1941	Do.
S-813-102-1	Surveys of Dove Creek-Ackmen watershed, San Miguel, Dolores and Montezuma Counties Colo.	do.	January 1939	Do.
S-813-102-2	Survey of watershed of the Smith's Fork of the Gunnison River, Gunnison Delta, and, Montrose Counties, Colo.	do.	September 1939	Do.
S-813-102-3	Survey of Plateau Creek watershed, Mesa County, Colo.	do.	do.	Do.
S-813-102-4	Survey of Hammond Incorporated Irrigation District, San Juan County, N. Mex.	do.	March 1940	Do.
S-813-102-5	Survey of Ashley Valley, Uintah and Daggett Counties, Utah	do.	October 1940	Do.
S-813-102-6	Survey of Smith's and Black's Forks watershed, Uintah County, Wyo.	do.	September 1938	Do.
S-813-102-7	Survey of Duchesne River area, Duchesne, Wasatch and Uintah Counties, Utah	do.	April 1941	Do.
S-813-103-1	Survey of Kirkland Creek watershed, Yavapai County, Ariz. Survey completed by the Bureau of Agricultural Economics and area plan approved by the Water Facilities Board.	\$72,250	October 1938	February 1941.
S-813-103-2	Survey of Concho area, Apache County, Ariz.	To be determined by survey.	September 1938	Under way.
S-813-103-3	Survey of Silver Creek and Woodruff watershed, Navajo and Apache Counties, Ariz.	do.	March 1939	Do.
S-813-103-4	Survey of the balance of Verde River watershed Coconino, Yavapai, Gila, and Maricopa Counties, Ariz.	do.	July 1941	Do.
S-813-103-5	Survey of the Northern Sulphur Springs Valley in Cochise and Graham Counties, Ariz. Survey completed by the Bureau of Agricultural Economics and area plan approved by the Water Facilities Board.	\$58,000	January 1940	October 1941.
S-813-103-6	Survey of the Upper Virgin River watershed, Washington, Kane, and Iron Counties, Utah, and Mohave County, Ariz. Survey completed by the Bureau of Agricultural Economics and area plan approved by the Water Facilities Board.	\$175,000	October 1938	April 1941.
S-813-103-6A	Survey of Pahranagat Valley subarea of the Virgin River watershed, Lincoln County, Nev. Survey completed by the Bureau of Agricultural Economics and area plan approved by the Water Facilities Board.	\$30,000	April 1939	February 1941
S-813-103-7	Survey of Upper Zuni River watershed, Valencia and McKinley Counties, N. Mex., and Apache County, Ariz.	To be determined by survey.	November 1939	Under way.
S-813-103-8	Survey of Carrizo Wash watershed, Valencia and Catron Counties, N. Mex. and Apache County, Ariz.	do.	do.	Do.
S-813-103-9	Survey of Upper Little Colorado watershed, Catron County, N. Mex. and Apache County, Ariz.	do.	January 1940	Do.
S-813-103-10	Survey of Lebanon area in Graham County, Ariz.	do.	March 1941	Do.
S-813-104-1	Survey of Susan River watershed, Lassen County, Calif.	do.	July 1939	Do.
S-813-104-2	Survey of the balance of the Malad River, Oneida County, Idaho	do.	September 1938	Do.
S-813-104-3	Survey of Steptoe-Springs Valley watershed, Elko, White Pine, and Lincoln Counties, Nev.	do.	November 1940	Do.
S-813-104-4A	Survey of Upper Bear River watershed, Utah	do.	September 1938	Do.
S-813-104-4B	Survey of Upper Bear River watershed in Bannock, Bear Lake, Caribou, Franklin, and Oneida Counties, Idaho.	do.	January 1941	Do.
S-813-104-5	Survey of Clarkston Creek watershed, Cache County, Utah	do.	January 1939	Do.
S-813-104-6	Survey of Nebo area, Utah, Juab, and Sanpete Counties, Utah	do.	July 1939	Do.
S-813-104-7	Survey of Tooele area, Tooele County, Utah	do.	November 1940	Do.
S-813-104-8	Survey of Pahvant Basin, Millard County, Utah	do.	do.	Do.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF AGRICULTURE—Continued</b>				
<b>Water Facilities Surveys—Continued</b>				
S-813-104-9.....	Survey of the Walker River watershed Mineral, Lyon, and Douglas Counties, Nev., and Mono County, Calif. Survey completed by the Bureau of Agricultural Economics and area plan approved by the Water Facilities Board.	\$126,300.....	September 1938.....	January 1941.
S-813-104-10.....	Survey of the Lower Sevier River area in Millard, Juab, and Sanpete Counties, Utah...	To be determined by survey.	September 1941.....	Under way.
S-813-105-1.....	Survey of Mendocino Coastal area, Mendocino and Sonoma Counties, Calif.....	do.....	November 1939.....	Do.
S-813-105-2.....	Survey of Russian River watershed, Mendocino, Lake, and Sonoma Counties, Calif.....	do.....	December 1939.....	Do.
S-813-105-3.....	Survey of Humboldt area, Humboldt, Mendocino, Trinity, Glenn, and Lake Counties, Calif.	do.....	do.....	Do.
S-813-105-4.....	Survey of Del Norte area, Del Norte County, Calif., and Josephine County, Oreg.....	do.....	January 1940.....	Do.
S-813-106-1.....	Survey of Placerville area, Placer and Eldorado Counties, Calif.....	do.....	December 1939.....	Do.
S-813-106-2.....	Survey of Upper Pit area, Modoc and Lassen Counties, Calif.....	do.....	November 1939.....	Do.
S-813-106-3.....	Survey of the Kaweah-Tule Area in Tulare, Kings, and Fresno Counties, Calif.....	do.....	November 1941.....	Do.
S-813-107-1.....	Survey of the balance of the Upper Salinas watershed, San Luis Obispo County, Calif.....	do.....	September 1938.....	Do.
S-813-108-1.....	Survey of San Jacinto watershed, Riverside County, Calif.....	do.....	November 1939.....	Do.
S-813-110-1.....	Survey of Little Lost River, Custer, Lemhi, and Butte Counties, Idaho.....	do.....	August 1938.....	Do.
S-813-110-2.....	Survey of Little Wood River, Blaine County, Idaho.....	do.....	August 1939.....	Do.
S-813-110-3.....	Survey of Bannock Creek, Bannock County, Idaho.....	do.....	September 1939.....	Do.
S-813-110-4.....	Survey of the balance of Opaline-Squaw Creek, Owyhee County, Idaho.....	do.....	do.....	Do.
S-813-110-5.....	Survey of the balance of Burnt River, Baker County, Oreg.....	do.....	July 1939.....	Do.
S-813-110-6.....	Survey of the balance of Star Valley, Lincoln County, Wyo.....	do.....	September 1938.....	Do.
S-813-110-7.....	Survey of the balance of Raft River, Cassia County, Idaho, and Box Elder County, Utah.....	do.....	August 1938.....	Do.
S-813-110-8.....	Survey of the Teton basin, Teton County, Idaho, and Teton County, Wyo.....	do.....	September 1939.....	Do.
S-813-110-9.....	Survey of Snake River Irrigation District, Ada County, Idaho.....	do.....	January 1941.....	Do.
S-813-110-10.....	Survey of the Mud Lake area, Clark, Jefferson, Fremont, Butte, and Lemhi Counties, Idaho.	do.....	do.....	Do.
S-813-110-11.....	Survey of the West Side Irrigation District, Bingham County, Idaho.....	do.....	do.....	Do.
S-813-110-12.....	Survey of the Snake River drainage basin in Power, Bannock, and Oneida Counties, Idaho.	do.....	February 1941.....	Do.
S-813-110-13.....	Survey of the Portneuf River drainage basin in Bannock, Bingham, Caribou, and Franklin Counties, Idaho.	do.....	April 1941.....	Do.
S-813-111-1.....	Survey of Clark Fork River, Pend Oreille County, Wash.....	do.....	October 1940.....	Do.
S-813-111-2.....	Survey of Bitter Root Valley, Ravalli and Missoula Counties, Mont.....	do.....	February 1939.....	Do.
S-813-111-3.....	Survey of Flathead County, Mont.....	do.....	October 1940.....	Do.
S-813-111-4.....	Survey of Mill Creek, Stevens County, Wash.....	do.....	September 1941.....	Do.
S-813-111-5.....	Survey of Ringold area, Franklin County, Wash.....	do.....	September 1939.....	Do.
S-813-111-6.....	Survey of the Riverland area, Benton County, Wash.....	do.....	November 1939.....	Do.
S-813-111-7.....	Survey of Pleasant Valley, Okanogan River, Okanogan County, Wash.....	do.....	January 1940.....	Do.
S-813-111-8.....	Survey of the Beaver Creek subarea, Methow River, Chelan County, Wash.....	do.....	September 1938.....	Do.
S-813-112-1.....	Survey of the balance of John Day Basin, Oreg.....	do.....	January 1939.....	Do.
S-813-112-2.....	Survey of Klickitat subarea No. 1, Klickitat and Yakima Counties, Wash.....	do.....	January 1940.....	Do.
S-813-113-1.....	Survey of Salmon Creek, Clark County, Wash.....	do.....	March 1939.....	Do.
S-813-115-1.....	Survey of Dungeness River, Clallam and Jefferson Counties, Wash.....	do.....	January 1940.....	Do.
S-813-116-1.....	Survey of Roberts Creek Basin, Douglas County, Oreg.....	do.....	August 1939.....	Do.
<b>DEPARTMENT OF COMMERCE</b>				
<b>Civil Aeronautics Administration</b>				
S-904-0-1.....	Survey of radio landing system installations at key airports throughout the country, consisting of an analysis of all recommendations submitted for the installation of those facilities, and the compilation of an up-to-date list of desirable projects for accomplishment during future construction programs.	\$1,876,000.....	April 1941.....	June 1941.
S-904-0-2.....	Survey for installation of approach light lanes at key airports throughout the country, consisting of the preparation of a master list of airports at which the installation of approach light lanes is considered desirable, the list being based upon studies of all recommendations submitted by the CAA regional offices, air carriers, airport operators, and other interested parties.	\$1,776,000.....	do.....	Do.
S-904-0-3.....	Survey for installation of fan markers at key points on Federal airways throughout the country, consisting of an analysis of all recommendations submitted by the CAA regional offices, air carrier operators, and other interested parties relative to the establishment of ultra high frequency fan markers, and the preparation of a master list of desirable new fan marker locations for future construction programs.	\$990,600.....	do.....	Do.
S-904-0-4.....	Survey for installation of low power fan markers at key points on Federal airways throughout the country, consisting of all recommendations submitted by the CAA regional offices, air carrier operators, and other interested parties, relative to the establishment of ultra high frequency low power fan markers, and the compilation of a master list of desirable marker locations for future construction programs.	\$1,022,000.....	do.....	Do.
S-904-0-5.....	Survey for installation of ultra high frequency radio ranges on existing airways throughout the country, consisting of a redetermination of the plan for the eventual replacement of intermediate frequency stations by the new type of stations and involves the coordination of the CAA future Ultra High Frequency Program with the fiscal year 1942 program.	\$7,346,500.....	May 1941.....	Do.



TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF COMMERCE—Continued</b>				
<b>Civil Aeronautics Administration—Continued</b>				
S-904-0-6.....	Survey for relocation of existing radio ranges at locations on Federal Airways throughout the country, consisting of an analysis of all radio range relocation projects made necessary because of airport relocations or expansions or for other reasons.	\$564,000.....	April 1941.....	June 1941.
S-904-0-7.....	Survey of installation of teletype for weather reporting and traffic control on the Federal Airways System, consisting of a determination of additional necessary projects to improve and develop the weather reporting and traffic control system throughout the country.	\$285,457.....	.....do.....	Do.
S-904-0-8.....	Survey for installation of ultra high frequency localizers at all scheduled air mail stops on the Federal Airways System, consisting of studies made in conjunction with the ultra high frequency radio range program, in order to provide UHF localizers for letdowns at terminal and intermediate stops on all airways.	\$6,150,000.....	May 1941.....	Do.
S-904-0-9.....	Survey of miscellaneous improvements to existing radio and communication facilities on airways throughout the country, consisting of compilation of master lists of desirable modernization and improvement projects from recommendations submitted by regional offices.	\$225,000.....	April 1941.....	July 1941.
S-904-0-10.....	Survey for relocation of sections of airways in the Federal Airways System, consisting of an analysis of all previously recommended projects for relocation of airways to determine their desirability, and the preparation of master lists of projects for future accomplishment.	\$261,800.....	.....do.....	June 1941.
S-904-0-11.....	Survey for establishment of high power broadcast stations throughout the country, including an analysis of broadcast station requirements in connection with the program for conversion of the Federal Airways radio range system from intermediate frequency to ultra high frequency. This is a map study to determine the number and location of stations required to provide complete broadcast service over the entire country and to provide sufficient stations for radio compass operations.	\$748,000.....	.....do.....	July 1941.
S-904-0-12.....	Survey for establishment of loop type radio ranges at various locations on the Federal Airways, consisting of an analysis of all recommendations received from regional offices, air carriers, and other interested parties relative to establishment of such facilities at newly certificated air mail stops and at other locations requiring ranges for traffic control purposes, for use as check points, and as landing aids.	\$369,600.....	.....do.....	June 1941.
S-904-0-13.....	Survey of intermediate field improvements on existing Federal Airways throughout the country, consisting of a study and analysis of all intermediate fields requiring improvements, based on recommendations from regional offices, air carriers, and other interested parties, and based on reconnaissance surveys.	\$1,502,800.....	.....do.....	Do.
S-904-0-14.....	Survey of Pacific Islands radio and communication facilities, consisting of a compilation of a master list of desirable projects as recommended for accomplishment for use in connection with interisland and trans-Pacific operations as well as for use by military services for national defense.	\$370,000.....	.....do.....	July 1941.
S-904-0-15.....	Nation-wide survey of public airports necessary for national defense, involving a preliminary investigation of airports to determine the useful units of improvement at each airport necessary to bring it up to the ultimate classification shown, after full coordination with approved projects of the Work Projects Administration under way or to be placed under way. Not to exceed 149 airports were selected for submission to the Approval Board for Airport Construction in order to develop a construction program.	\$46,522,080.....	June 1941.....	August 1941.
S-904-0-16.....	Nation-wide survey of public airports necessary for national defense, involving a preliminary investigation of 162 airports to determine the useful units of improvement at each airport necessary to bring it up to the recommended classification, after full coordination with approved projects of the Work Projects Administration under way or to be placed under way.	To be determined by survey.	September 1941.....	Under way.
The following surveys involve establishment of air navigation facilities including intermediate fields and/or radio range and communication facilities for the development of certified airways to permit authorization of day and night contact and instrument and on-top operations:				
S-904-4-20.....	Fresno-Las Vegas Airway, Fresno, Calif., to Las Vegas, Nev.....	\$103,100.....	February 1941.....	March 1941.
S-904-9-12.....	Augusta-Savannah Airway, Augusta, Ga., to Savannah, Ga.....	\$18,000.....	.....do.....	Do.
S-904-9-14.....	Atlanta-Cincinnati Airway, Atlanta, Ga., to Cincinnati, Ohio, via Knoxville, Tenn., and Lexington, Ky.....	\$106,000.....	.....do.....	February 1941.
S-904-12-3.....	Fort Wayne-Pittsburgh Airway, Fort Wayne, Ind., to Pittsburgh, Pa.....	\$35,000.....	.....do.....	April 1941.
S-904-16-6.....	New Orleans-Birmingham Airway, Louisiana and Alabama.....	\$43,300.....	April 1941.....	Do.
S-904-17-27.....	Bangor-Moncton Airway, Maine.....	\$34,500.....	.....do.....	Do.
S-904-23-2.....	St. Louis-Muscle Shoals Airway, Evansville, Ind.-Muscle Shoals, Ala., section.....	\$69,000.....	February 1941.....	March 1941.
S-904-23-3.....	St. Louis-Cincinnati Airway, St. Louis, Mo., to Cincinnati, Ohio.....	\$20,000.....	.....do.....	Do.
S-904-24-9.....	Great Falls-Lethbridge Airway, Mont.....	\$11,000.....	.....do.....	Do.
S-904-27-7.....	Concord-Portland Airway, Concord, N. H., to Portland, Maine.....	\$9,000.....	April 1941.....	April 1941.
S-904-29-6.....	Las Vegas-Albuquerque Airway, New Mexico, via Santa Fe, N. Mex.....	\$27,000.....	February 1941.....	March 1941.
S-904-36-12.....	Pittsburgh-Birmingham Airway, Pittsburgh, Pa., to Birmingham, Ala., via Wheeling and Charleston, W. Va., and Bristol and Chattanooga, Tenn.....	\$100,300.....	.....do.....	Do.
S-904-40-4.....	Knoxville-Norfolk Airway, Knoxville, Tenn., to Norfolk, Va., via Asheville, Greensboro, Raleigh, and Rocky Mount, N. C.....	\$119,100.....	.....do.....	February 1941.
S-904-41-29.....	El Paso-Albuquerque Airway, El Paso, Tex., to Albuquerque, N. Mex., via Carlsbad, Hobbs, and Roswell, N. Mex.....	\$162,000.....	.....do.....	April 1941.
S-904-41-30.....	Houston-Memphis Airway, Houston, Tex., to Memphis, Tenn., via Shreveport, La., and Pine Bluff, Ark.....	\$124,000.....	.....do.....	February 1941.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF COMMERCE—Continued</b>				
<b>Civil Aeronautics Administration—Continued</b>				
S-904-46-1.....	Morgantown-Baltimore Airway, West Virginia and Maryland.....	\$43,400.....	February 1941.....	March 1941.
S-904-46-2.....	Parkersburg-Elkins Airway, Parkersburg, W. Va., to Elkins, W. Va.....	\$21,000.....	do.....	Do.
S-904-50-28.....	Survey of Federal airways in Alaska, consisting of an analysis of recommendations by the CAA Alaska office and by the War and Navy Departments for the establishment of air navigation facilities on Alaskan airways for commercial and itinerant use, and at other points for use in connection with national defense.	\$11,064,000.....	May 1941.....	July 1941.
<b>DEPARTMENT OF THE INTERIOR</b>				
<b>Bureau of Reclamation</b>				
S-702-66-1.....	Reconnaissance, land classification, reservoir and canal surveys, and water supply and economic studies on the Missouri River and tributaries, Great Falls to Fort Peck, Mont., to determine potential irrigation developments in the various tributary basins. Separate investigations of the Teton, Marias, Judith, Flatmellow, and Mussellshell Rivers are being conducted. The Marias Survey, Docket No. S-702-66-7 is listed below.	To be determined by survey.	July 1939.....	Under way.
S-702-66-2.....	Reconnaissance, land classification, canal surveys, siphon and pumping plant location surveys, water supply and economic studies, on Missouri River and tributaries near Glasgow, Mont., to determine the feasibility of irrigating lands along the Milk River and Missouri River and tributaries, including pumping possibilities with storage in Fort Peck Reservoir.	do.....	September 1938.....	Do.
S-702-66-3.....	Reconnaissance, land classification, reservoir and canal surveys, and water supply and economic studies on the Missouri River and tributaries above Great Falls, near Helena, Mont., to determine potential irrigation developments in the various tributary basins and possible method of providing such without interfering with present irrigation and power rights, and to determine possible flood-control requirements.	do.....	July 1939.....	Do.
S-702-66-4.....	Survey of the Madison River Project on the Madison and Snake Rivers in Idaho and Montana, consisting of a reconnaissance to determine irrigation potentialities within the Madison River watershed and possibility of diverting from the upper Madison River to Henry's Fork in the Snake River Basin. A reconnaissance report on this Madison-Snake diversion was submitted in 1935, and land classification of irrigable areas along Madison River have been made and reservoir surveys completed for Cherry Creek and Madison River sites. Investigations have been suspended pending the completion of a basin-wide report on the Missouri River above Great Falls, Mont., Docket No. S-702-66-3, listed above.	do.....	July 1935.....	Survey temporarily suspended.
S-702-66-5.....	Survey of Rock Creek, tributary of the Milk River, Mont., consisting of preliminary studies of water supply and land classification, to determine the feasibility of furnishing supplemental water to lands along Rock Creek and Milk River at confluence of the streams.	do.....	August 1938.....	Under way.
S-702-66-6.....	Survey of the Fort Peck pumping project, Montana, and North Dakota, consisting of a reconnaissance survey of potential irrigation pumping projects along the Missouri River, and preliminary canal and power line locations, to determine the feasibility of irrigating lands along the Missouri River between Fort Peck Dam and Bismarck, N. Dak., and land in Big Dry Creek—Redwater Creek area near Circle, Mont.	do.....	September 1938.....	Do.
S-702-66-7.....	Survey of the Marias Project on the Marias River, Mont. A report was submitted in June 1939, covering possibility of constructing a reservoir for irrigation of lands south and east of Shelby, Mont. The current investigation includes additional sites for irrigating area near Big Sandy and adjacent to Big Sandy Creek to the Milk River.	do.....	January 1940.....	Do.
S-702-66-8.....	Survey of Canyon Ferry on Missouri River, Mont., consisting of a topographical and geological examination of a dam site situated below present Canyon Ferry dam and power plant of Montana Power Co., primarily for power replacement storage to offset depletion of Missouri River flows at power plants of Montana Power Co., in order to continue irrigation developments in Missouri River. Work suspended pending completion of basin-wide report on Missouri River above Great Falls, Mont., Docket No. S-702-66-3, listed above.	do.....	October 1938.....	Survey temporarily suspended.
S-702-66-9.....	Survey of Gallatin Valley Project on the West Gallatin River, Mont. The preliminary report dated 1937 proposes a reservoir of 210,000 acre-feet at a cost of \$6,685,000. The investigation includes survey of reservoir on Spanish Creek, to provide supplemental water for about 97,000 acres for which canals and laterals are mostly constructed at the present time. Work on the survey is now suspended pending completion of basin-wide report on the Missouri River above Great Falls, Mont., Docket No. S-702-66-3, listed above.	do.....	1936.....	Do.
S-702-66-10.....	Survey of Daley Spur on the Beaverhead River, Mont., consisting of a detailed study of geologic and topographic conditions at several dam and reservoir sites on Beaverhead River and on Grasshopper and Horse Prairie Creeks, to investigate the possibility of furnishing supplemental water supply to lands in the vicinity of Dillon. Preparation of report has been suspended pending completion of the report on the Missouri River above Great Falls, Docket No. S-702-66-3, listed above.	do.....	October 1939.....	Do.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF THE INTERIOR—Continued</b>				
<b>Bureau of Reclamation—Continued</b>				
S-702-67-1.....	Reconnaissance, land classification, reservoir and canal surveys, and water supply, power and economic studies, on the Yellowstone River and tributaries, Montana and Wyoming, near Livingston and Billings, to determine feasible storage site below Yellowstone National Park for irrigation of lands in Montana; and includes separate investigations on Big Horn, Powder and Tongue Rivers, and Sweet Grass Creek. The Big Horn survey, Docket No. S-702-67-2, and the Sweet Grass survey, Docket No. S-702-67-6, are listed below.	To be determined by survey.	July 1939.....	Underway.
S-702-67-2.....	Reconnaissance survey of Big Horn River and tributaries in Montana and Wyoming, near Powell and Thermopolis, including detailed surveys of potential Cave Canyon, Upper Big Horn, Lower Big Horn, and several other reservoir sites, to ascertain irrigation possibilities for 544,464 acres which are potentially irrigable within the basin. Separate investigations in the area are those on the Paint Rock Valley, Docket No. S-702-67-4, Owl Creek, Docket No. S-702-67-3, Hardin, Docket No. S-702-67-5 and Buffalo Basin Docket No. S-702-67-7, listed below.	do.....	do.....	Do.
S-702-67-3.....	Survey of Owl Creek, Wyo., involving a continuation of examination surveys to determine the feasibility of water diversion from Wood River to Owl Creek and storage on Owl Creek to provide supplemental water, and preparation of report. The project is being considered for construction under the Water Conservation and Utilization Act of Aug. 11, 1939, as amended. This is one of the detail surveys included in the General Big Horn investigations, Docket No. S-702-67-2, listed above.	do.....	do.....	Do.
S-702-67-4.....	Survey of Paint Rock Valley, Big Horn River, Wyo., including land classification, water supply and economic studies, and dam designs and estimates, to investigate irrigation possibilities for consideration under provisions of the Water Conservation and Utilization Act of Aug. 11, 1939, as amended. This is one of the detail surveys included in the General Big Horn investigations, Docket No. S-702-67-2, listed above.	do.....	July 1940.....	Do.
S-702-67-5.....	Survey of Hardin (Lower Big Horn), Mont., including land classification, topographic surveys, field data on canal line and structures, estimates of canal quantities, water supply and storage requirements to serve land on the Lower Big Horn near Hardin, Mont. Incidental power and flood control features will probably be involved. Work has been suspended on this detail survey pending completion of the general Big Horn investigations, Docket No. S-702-67-2, listed above.	do.....	July 1939.....	Survey temporarily suspended.
S-702-67-6.....	Survey of Sweet Grass Creek, Mont., to determine the storage possibilities on the headwaters of Sweet Grass Creek to augment the present supply of irrigation by direct flow. Involved are dam site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report. This is one of the detail surveys included in the general Yellowstone Basin survey, Docket No. S-702-67-1, listed above.	do.....	May 1941.....	Under way.
S-702-67-7.....	Survey of Buffalo Basin, Big Horn River, Wyo., to determine potential irrigation developments. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report. This is one of the detail surveys included in the Big Horn investigations, Docket No. S-702-67-2, listed above.	do.....	July 1939.....	Do.
S-702-68-1.....	Reconnaissance, land classification, reservoir and canal surveys, and water supply and economic studies in the basin of the Missouri River Western tributaries, North Dakota, South Dakota, and Nebraska, near Bismarck and Pierre, to determine the irrigation potentialities in the watersheds of the various western tributaries of the Missouri River. Separate field surveys have been made on Cannonball, Heart, Knife, and Grand Rivers, which are main tributaries. The Knife River survey, Docket No. S-702-68-4, is listed below.	do.....	June 1939.....	Do.
S-702-68-2.....	Survey of Missouri River pumping projects, North Dakota, and South Dakota, near Bismarck and Pierre, including land classification, pumping plant and canal locations, and water supply and economic studies, to determine potential irrigation projects to be developed by pumping from the Missouri River.	do.....	December 1939.....	Do.
S-702-68-3.....	Survey of Little Missouri River, Mont., N. Dak., S. Dak., and Wyo., including land estimates, reservoir surveys, and cost estimates to determine the availability of water supply and irrigable land. This survey is being conducted in cooperation with the Corps of Engineers.	do.....	do.....	Do.
S-702-68-4.....	Survey of Knife River, N. Dak., including reconnaissance, soil, reservoir and dam site surveys, water supply studies, and preparation of report, to determine irrigation possibilities. This is one of the detail surveys included in the Missouri River Western tributaries investigations, Docket No. S-702-68-1, listed above.	do.....	June 1939.....	Do.
S-702-69-1.....	Survey of Belle Fourche Supplemental Water Supply, Belle Fourche River, S. Dak., involving study of storage sites on Belle Fourche River suitable for multiple uses, to determine the possibility of providing supplemental storage for lands under Inlet Canal and Johnson lateral of the Belle Fourche Project.	do.....	August 1939.....	Do.
S-702-69-2.....	Survey of Beaver Creek (Buffalo Gap), S. Dak., including water studies, topographic surveys, and collection of economic data, to determine the feasibility of irrigating about 8,000 acres of land with storage in an offstream reservoir, with capacity of 16,000 acre-feet, supplied by feeder canals from Fall River and Beaver Creek.	do.....	October 1938.....	Do.
S-702-72-1.....	Kortes Survey, North Platte River, Wyo., consisting of an investigation of power development possibilities on the North Platte below Seminole Dam, including detail geologic investigations, and preparation of plans, estimates, and reports.	do.....	May 1941.....	Do.

TABLE II.—*Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued*

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF THE INTERIOR—Continued</b>				
<b>Bureau of Reclamation—Continued</b>				
S-702-72-2.....	Survey of Blue River-South Platte River Diversion, Colorado, to investigate means of diverting water from upper tributaries of Blue River to the South Platte Basin to supplement the domestic water supply of Denver, and furnish supplemental irrigation water to lands in that vicinity. Involved are preliminary canal and tunnel surveys, diversion sites, land classification, water supply and economic studies, geologic examination, dam site exploration, and preparation of plans, estimates, and report.	To be determined by survey.	March 1936.....	Under way.
S-702-73-1.....	Survey of Eastern Slope, Colorado, near Denver, including the North Republican, Arkkaree, South Republican, and Smoky Hill Rivers, relative to land classification, reservoir and canal surveys, water supply, power, and economic studies, to determine possible irrigation, flood control, and power projects within the State of Colorado on the eastern slope of the continental divide. Completed investigation reports in the basin include Hugo and Chivington and Cherry Creeks. Since the expenditure of PWA funds, investigations have been continued with general funds for completion of the North Republican River report, Docket No. S-702-73-11, listed below; and completion of investigations on the South Republican and Arkaree Basins. Complete investigations and separate reports are anticipated on the various tributaries of the Arkansas River.	do.....	October 1936.....	Do.
S-702-73-2.....	Survey of Bostwick, Republican River, Kans. and Nebr., involving water supply and flood studies, land classification, and collection of economic data, for investigation of storage possibilities on the Republican River for flood control and potential irrigation developments between Alma, Nebr., and Concordia, Kans. The project lands lie below Republican City and may be served by waters from the Republican River with storage at the Harlan County Site.	do.....	April 1940.....	Do.
S-702-73-3.....	Survey of Cambridge, on Red Willow and Medicine Creeks, tributaries of the Republican River, Nebr., including land classification, water supply and storage studies, to determine the feasibility of potential irrigation and flood control projects.	do.....	August 1940.....	Do.
S-702-73-4.....	Kansas Reconnaissance Survey along the Smoky Hill River, North and South Forks of Solomon River and tributaries, Kansas, consisting of reconnaissance, land classification, canal line and reservoir topographic surveys, water supply and economic studies to determine the possibility of supplying supplemental water to western Kansas area affected by severe water shortage.	do.....	October 1937.....	Do.
S-702-73-5.....	Survey of Smoky Hill River, Kans. and Colo., to determine the potentialities of the Smoky Hill River for irrigation, flood control, and power development. Involved are basin-wide reconnaissance of reservoir sites, preliminary canal line surveys, water supply and economic studies, preparation of report, and cooperation with the War Department.	do.....	April 1940.....	Do.
S-702-73-6.....	Frenchman Valley Survey, Nebraska, to determine possible reservoir sites to supply additional water supply for irrigation in Frenchman Valley, and for flood control on the Republican River. Involved are dam site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, preparation of plans, estimates, and report, and cooperation with the War Department.	do.....	July 1940.....	Do.
S-702-73-7.....	Survey of Buffalo Creek, Nebr., to determine the feasibility of irrigation development on Buffalo Creek and in the Republican River Valley adjacent to Buffalo Creek. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisal, and preparation of plans, estimates, and report.	do.....	January 1941.....	Do.
S-702-73-8.....	Kirwin Survey, Solomon River, Kans., to determine the feasibility of irrigation development, using storage water from proposed reservoirs on Solomon River, and to determine feasibility of flood control measures. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	do.....	July 1941.....	Do.
S-702-73-9.....	Cedar Bluff Survey, Smoky Hill River, Kans., to determine the feasibility of irrigation development, using storage water from proposed storage reservoirs on Smoky Hill River. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates and report.	do.....	do.....	Do.
S-702-73-10.....	St. Francis Survey, South Fork Republican River, Kans., to determine the feasibility of providing a supplemental supply of water to lands below St. Francis, and developing new areas using storage reservoir for flood control. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	do.....	January 1941.....	Do.
S-702-73-11.....	North Republican (Wray) Survey, Colorado and Nebraska, to determine feasibility of supplying new and supplemental water for irrigation near Wray, Colo., and Hailger, Nebr., using storage in proposed reservoir on the North Fork of Republican River. Involved are reconnaissance of reservoir sites, preliminary surveys, land classification, water supply and economic studies, right-of-way appraisals, geologic examination and dam site exploration, and preparation of plans, estimates, and report.	do.....	March 1936.....	Do.
S-702-78-1.....	Arkansas Valley Survey along the Arkansas River and tributaries, Colorado, and Kansas, consisting of mapping of irrigable lands, land classification, and water supply studies to determine water requirements of irrigated and irrigable lands in valley, feasible reservoir sites, flood control possibilities and incidental power development and land classification, including use of John Martin Reservoir storage.	do.....	January 1939.....	Do.
S-702-80-1.....	Kenton Survey along Cimarron River, Okla., consisting of detailed study of water supply and possible storage, to be a continuation of previous surveys with a report supplemental to that completed in July 1938, to determine project feasibility.	do.....	September 1940.....	Do.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF THE INTERIOR—Continued</b>				
<b>Bureau of Reclamation—Continued</b>				
S-702-80-2.....	Cimarron Project Survey on the Cimarron River and tributaries, New Mexico, Oklahoma, Kansas, and Colorado, consisting of study of existing irrigation, recreational and land conservation developments, inventory of irrigation possibilities, collection of economic data, and reservoir and dam site surveys and report, to determine potential irrigation developments and storage possibilities for a supplemental supply. The survey includes entire Cimarron basin except Kanton project investigation, S-702-80-1, listed above.	To be determined by survey.	June 1940.....	Under way.
S-702-80-3.....	Baker Survey, Cimarron River and tributaries, New Mexico, to determine storage possibilities on the Dry Cimarron River to irrigate land in the Cimarron River Valley in Union County, N. Mex. Involved are dam site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisal, and preparation of plans, estimates, and report. This is one of the detail surveys included in the Cimarron Basin survey, Docket No. S-702-80-2, listed above.	do.....	July 1941.....	Do.
S-702-81-1.....	Investigations in the South Canadian Basin, N. Mex., Tex., and Okla., near Oklahoma City, including general reconnaissance of the basin, and preliminary reservoir and canal surveys, and water supply and economic studies, to determine irrigation potentialities. Included is a separate investigation of Ute Creek, Docket No. S-702-81-3, listed below.	do.....	October 1939.....	Do.
S-702-81-2.....	North Canadian River Investigations, along the North Canadian River and tributaries, Oklahoma, consisting of preliminary survey including land classification and canal locations, water supply and economic studies, and cost estimates, to determine the feasibility and extent of potential irrigation development below proposed Fort Supply, Optima, Beaver, and Canton Reservoirs. Included are separate investigations of Mutual (Fort Supply), Docket No. S-702-81-4, Canton, Docket No. S-702-81-5, and Laverne, Docket No. S-702-81-6, listed below.	do.....	March 1938.....	Do.
S-702-81-3.....	Survey of Ute Creek, N. Mex., to determine methods of providing storage for irrigation water to serve land located in Ute Creek Valley. Involved are dam site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report. This is one of the detail surveys included in the South Canadian River investigations, Docket No. S-702-81-1, listed above.	do.....	July 1941.....	Do.
S-702-81-4.....	Mutual Survey (Fort Supply), North Canadian River, Okla., to determine feasibility of providing irrigation water for lands in the vicinity of Mutual, Okla., using water stored in the Fort Supply Reservoir. Involved are pumping plant site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisal, and preparation of plans, estimates, and report. This is one of the detail surveys included in the basin-wide survey of the North Canadian River, Docket No. S-702-81-2, listed above.	do.....	do.....	Do.
S-702-81-5.....	Canton Survey, North Canadian River, Okla., to provide supplemental irrigation water for an area below Canton, and to provide for flood control and river regulation. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report. This is one of the detail surveys included in the basin-wide survey of the North Canadian River, Docket No. S-702-81-2, listed above.	do.....	March 1938.....	Do.
S-702-81-6.....	Laverne Survey, North Canadian River, Okla., to determine the feasibility of diverting water from the North Canadian River to irrigate lands in the vicinity of Laverne. Involved are reconnaissance and preliminary surveys of canal lines, pump sites, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report. This is one of the detail surveys included in the North Canadian River investigations, Docket No. S-702-81-2, listed above.	do.....	July 1941.....	Do.
S-702-85-1.....	Survey in Red River Basin, Tex. and Okla., near Wichita Falls, including reconnaissance of the basin, and water supply studies and report, to determine potential irrigation developments throughout the basin. Included are the survey of Mangum, Docket No. S-702-85-2, and Washita River survey, Docket No. S-702-85-3, listed below.	do.....	November 1938.....	Do.
S-702-85-2.....	Survey of Mangum, Okla., on the Salt Fork of the Red River, consisting of a reconnaissance to determine the present development in Salt Fork basin; surveys of dam and reservoir sites; water supply studies; and study of the value of flood control. Purpose is to determine the feasibility of utilizing Salt Fork for irrigation in the vicinity of Mangum, Okla., or to supplement the Altus project water supply. This is one of the detail surveys included in the basin-wide survey of Red River and tributaries, Docket No. S-702-85-1, listed above.	do.....	October 1939.....	Do.
S-702-86-1.....	Survey of Washita River, Okla., consisting of a reconnaissance of sub-basin for possible storage sites, and topographic and geologic surveys of selected reservoir sites, to determine the feasibility of irrigation development within the basin. This is one of the detail surveys included in the basin-wide survey of Red River and tributaries, Docket No. S-702-85-1, reported above.	do.....	December 1938.....	Do.
S-702-96-1.....	Survey of Brazos River, Tex., near Waco, above Possum Kingdom Dam, involving reconnaissance survey of entire basin above Mineral Wells, including the Breckenridge project in Throckmorton County and the Seymour project in Stonewell and Haskett Counties, to determine possible irrigation and storage projects in the basin above Possum Kingdom Reservoir.	do.....	March 1940.....	Do.
S-702-96-2.....	Survey of San Saba River Basin, Tex., to determine the feasibility of irrigation development and flood control possibilities. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, water supply and economic studies, and preparation of reports.	do.....	July 1941.....	Do.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF THE INTERIOR—Continued</b>				
<b>Bureau of Reclamation—Continued</b>				
S-702-96-3	Survey of Concho River, Tex., to determine the feasibility of irrigation development and flood control requirements. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, water supply and economic studies, and preparation of reports.	To be determined by survey.	July 1941	Under way.
S-702-97-1	Robert Lee Survey along Colorado River of Texas, consisting of detailed investigation including land classification, water supply studies, storage possibilities, estimates, and designs to determine the feasibility of irrigating 40,000 to 50,000 acres of land on the south side of the Colorado River near Robert Lee and Tennyson, Tex.	do.	March 1939	Do.
S-702-99-1	Survey of Nueces River, Tex., to determine the feasibility of flood control and irrigation development, and the passing of surface waters from the upper portion of the basin. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, water supply and economic studies, preparation of report, and cooperation with the War Department.	do.	January 1941	Do.
S-702-99-2	Cotulla Survey, Nueces River, Tex., to provide storage facilities on the Nueces River for irrigation of land near Cotulla, and for river regulation and flood control. Involved are dam-site explorations, canal surveys, land classification, right-of-way appraisal, and preparation of plans, estimates, and reports.	do.	April 1941	Do.
S-702-100-1	Joint investigations in Pecos River Basin, N. Mex. and Tex., near Roswell, including reconnaissance, studies of water supply, salinity, sedimentation, and determinations of flood control, irrigation, and power possibilities.	do.	July 1939	Do.
S-702-100-2	Balmorhea Survey along Toyah Creek, tributary of the Pecos River, Tex., consisting of a detailed study of existing water supply obtained from San Solomon Springs and Toyah Creek with storage at Phantom Lake and at the lower Park Reservoir, installation of gaging stations, reservoir and canal surveys, land classification and water supply survey, to determine the feasibility of rehabilitating the existing project to provide adequate and safe structures, assure competent water supply and possible additional storage, to prepare project report, and for detailed foundation exploration and location survey for preparation of construction plans and estimates. This survey is related to the Pecos River Joint Investigation undertaken by the National Resources Planning Board.	do.	March 1939	Do.
S-702-101-1	Survey of Middle Rio Grande Valley, N. Mex., consisting of a detailed inventory of present development, economic studies, and water supply studies, to determine needs of new structures required for rehabilitation of present works and desirable measures for stabilizing economic conditions of the Middle Rio Grande Conservancy District.	do.	January 1940	Do.
S-702-102-1	Colorado River Basin surveys, California, Colorado, Arizona, Nevada, New Mexico, Utah and Wyoming, including land classification of arable and irrigated areas, water supply studies, power site and market surveys, and flood damage and control studies, to formulate a comprehensive scheme for control, improvement, and utilization of the water of the Colorado River and its tributaries for irrigation, power, and other purposes. This is a general survey consisting of many individual investigations, some of which are listed below.	do.	January 1931	Do.
S-702-102-2	Surveys of Western Slope, Colorado, near Grand Junction, including reconnaissance, land classification, water supply, power, and economic studies on various tributaries of the upper Colorado River; the investigations limited to settled areas where water users are willing to repay the cost of the works in the event that the investigations show the feasibility of the project and the irrigators desire its construction. Included in basin-wide survey are investigations on Mancos, Florida, Paonia, Silt, Roan Creek, Yampa, Troublesome, Piceance, Collbran, Rifle, West Divide, and La Plata projects. Separate reports have been made on the Mancos, Florida, Paonia, Silt, Yampa, West Divide, and La Plata projects.	do.	July 1936	Do.
S-702-102-3	Surveys in San Juan Basin, N. Mex., near Durango, including land classification surveys of all arable land, and surveys of Montezuma-Dolores project and water uses alternative to San Juan-Chama diversion project, to determine the feasibility of projects for irrigation, generation of electric power, and other purposes in the States of Colorado and New Mexico.	do.	July 1938	Do.
S-702-102-4	Silt survey of Middle Fork of Elk Creek, Rifle, and Silt Creeks, Upper Colorado basin, Colorado, consisting of detailed foundation exploration and location survey of possible reservoir sites on Meadow, Silt, Rifle, Clark, and West Elk Creeks. It may involve diversion from Corral Creek to West Elk Creek and possible pumping from Colorado River to project lands. Survey is to determine the feasibility of furnishing a supplemental water supply to the lands of the Silt Public Irrigation District. This is one of the detail surveys included in the Colorado River Basin surveys, Docket No. S-702-102-1, listed above.	do.	June 1936	Do.
S-702-102-5	Collbran Survey along Plateau Creek, Upper Colorado Basin, Colo., consisting of detailed investigation including topographic surveys and geological studies of Vega Reservoir, and surveys covering possibility of reconstructing various canals, stream gaging, and water supply and economic studies, to determine the feasibility of supplementing the water supply of lands along Plateau Creek. This is one of the detail surveys included in the Colorado River Basin surveys, Docket No. S-702-102-1, listed above.	do.	June 1936	Do.



TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF THE INTERIOR—Continued</b>				
<b>Bureau of Reclamation—Continued</b>				
S-702-102-6.....	Survey of Upper Gunnison River, Colo., consisting of a reconnaissance of Upper Gunnison Basin including examination of possible developments, stream-flow studies, and canal diversions, to determine possibilities for development of irrigation, incidental power, and flood control projects. This is one of the detail surveys included in basin-wide survey of Colorado River Basin, listed above.	To be determined by survey.	1939.....	Under way.
S-702-102-7.....	Survey of Little Snake River (Baggs), Colo., and Wyo., involving detailed studies of land classification, dam and reservoir sites, and possible storage of water on Elkhead Creek and importation of water from the creek; to determine a feasible method of supplying supplemental water to irrigated land and a full supply to the irrigable area of the basin. This is one of the detail surveys included in basin-wide survey of the Colorado River Basin, Docket No. S-702-102-1, listed above.	.....do.....	August 1938.....	Do.
S-702-102-8.....	Survey of Dolores River, Colo. and Utah, consisting of a detailed study of possible storage sites on the Dolores River, and land classification and canal surveys, to determine supplemental requirements of the Montezuma project and the feasibility of additional development in the Devo Creek area. This is one of the detail surveys included in basin-wide survey of the Colorado River Basin, Docket No. S-702-102-1, listed above.	.....do.....	July 1939.....	Do.
S-702-102-9.....	Survey of Emery County, Utah, San Rafael River and tributaries, consisting of a topographic survey of Miller's Flat and Joe's Valley reservoir sites on Cottonwood and Huntington Creeks, and land classification and mapping of 12,500 acres in the San Rafael Basin; to determine need for supplemental water in Emery County and the best use of the available water supply. This is one of the detail surveys included in the basin-wide survey of the Colorado River Basin, Docket No. S-702-102-1, listed above.	.....do.....	June 1939.....	Do.
S-702-102-10.....	Survey of Four Mile Creek, tributary to Roaring Fork, upper Colorado River Basin, Colo., to determine the feasibility of a small storage reservoir on upper Four Mile Creek to supplement existing irrigation works. Involved are dam-site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and reports.	.....do.....	April 1941.....	Do.
S-702-102-11.....	Pinedale Survey, New Fork River, Wyo., to determine feasibility of furnishing supplemental water to land near Pinedale and full water supply to lands along the east side of Green River, utilizing storage in proposed reservoirs on headwaters of Green River. Involved are reconnaissance of reservoir sites, water supply and economic studies, land classification, dam-site exploration and geologic examination, and preparation of plans, estimates, and report. This is one of the detail surveys included in the general Green River Surveys, Docket No. S-702-102-18, listed below.	.....do.....	September 1938.....	Do.
S-702-102-12.....	Grand Mesa Survey, Gunnison River, Colo., to determine the storage possibilities on Grand Mesa for development of additional water to supplement the supply for lands now irrigated, and new lands on the North Fork of the Gunnison River. Involved are dam-site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	June 1939.....	Do.
S-702-102-15.....	Parker-Phoenix Aqueduct Survey, Colorado River, Ariz., to develop a method of supplementing the water supply for irrigated lands dependent on the Salt and Gila Rivers, and for irrigation of new lands in Paradise Valley, north of Phoenix. Involved are reconnaissance of canal lines, tunnel sites, pumping sites, preliminary surveys, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates and report. This is one of the detail surveys included in Colorado River Basin Surveys, Docket No. S-702-102-1, listed above.	.....do.....	October 1940.....	Do.
S-702-102-16.....	Survey of San Miguel River Basin, Colo., to determine the irrigation and power development potentialities and flood control requirements of the basin. Involved are reconnaissance of possible reservoir sites, preliminary canal line survey, water supply and economic studies, and preparation of report.	.....do.....	July 1941.....	Do.
S-702-102-17.....	Montrose Power Survey, Uncompahgre River, Colo., consisting of a study of Gunnison River power potentialities and needs in Uncompahgre Valley and adjacent areas. Involved are reconnaissance of reservoir sites, preliminary surveys, water supply and economic studies, right-of-way appraisals, geologic examination and dam-site exploration, and preparation of plans, estimates, and report.	.....do.....	June 1939.....	Do.
S-702-102-18.....	Green River Surveys, Wyo., to determine irrigation, flood control, and power potentialities within the Green River watershed. Involved are preliminary reservoir and canal line surveys, land classifications, water supply and economic studies, and preparation of plans, estimates, and report. Individual surveys included are Pinedale, Sublette, Seedoladee, Opal, Fontanelle, and La Barge. The Pinedale Survey, Docket No. S-702-102-11, is listed above.	.....do.....	March 1937.....	Do.
S-702-102-19.....	Animas-La Plata Survey, Colorado, to determine the feasibility of diverting water from the Animas River to the La Plata River, utilizing storage sites on the Animas to supplement present water supply and develop new lands in Colorado and New Mexico. Involved are reconnaissance of reservoir sites, preliminary surveys, land classification, water supply and economic studies, right-of-way appraisals, geologic examination and dam-site exploration, preparation of plans, estimates and report, and cooperation with the Bureau of Indian Affairs.	.....do.....	November 1938.....	Do.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF THE INTERIOR—Continued</b>				
<b>Bureau of Reclamation—Continued</b>				
S-702-102-20....	Green and Colorado River Power Survey, Utah, to determine the feasibility of power development and flood-control possibilities. Included are surveys of Dewey, Echo Park, Split Mountain, Rattlesnake, and Dark Canyon dam sites, and Utah Power Market Survey. Involved are reconnaissance of possible reservoir sites, preliminary surveys, water supply and economic studies, investigation of power markets, and preparation of report.	To be determined by survey.	August 1938.....	Under way.
S-702-103-1.....	Survey of Williams River, in Mohave, Yuma, and Yavapai Counties, Ariz., near Prescott, including reconnaissance survey of watershed involving land classification, investigations of Almo Townsend Mine and Planet dam sites, and possibility of pumping from these sites to the irrigable area south of the river, to determine the feasibility of storage development for irrigation, flood control, and power purposes.	.....do.....	July 1939.....	Do.
S-702-103-2.....	Reconnaissance of Little Colorado River watershed, Arizona, near Winslow, including surveys of reservoir sites and canals, and also water-supply studies, to determine irrigation possibilities along the river. Included in the basin-wide studies are the Showlow, Woodruff, Clear Creek, Chevalon Creek and St. Johns areas.	.....do.....	January 1939.....	Do.
S-702-103-3.....	Preliminary surveys of Virgin River, Utah and Nev., including land classification and water-supply studies, and detail survey of reservoir sites and canal lines for selected projects; the purpose of which is to formulate a comprehensive plan of developing the water resources of the basin and to determine the feasibility of selected developments.	.....do.....	July 1938.....	Do.
S-702-103-4.....	Preliminary survey of Chuckawalla Valley, Colorado River, Calif., including land classification of Chuckawalla Valley northwest of Blythe, and canal surveys from the river to the valley, to determine the feasibility of irrigating Chuckawalla Valley from the Colorado River. This is one of the projects included in the basin-wide survey of the Colorado River Basin, Docket No. S-702-102-1, listed above.	.....do.....	July 1939.....	Do.
S-702-103-5.....	Survey of Bullshead Reservoir (Davis Dam) on the Colorado River, Ariz. and Nev., consisting of a detailed investigation including foundation exploration and topographic surveys of reservoir site and two or more dam sites, detailed cost and power estimates, and exploration for materials; to determine the feasibility of the dam site for power development and river regulation. The report has been completed and sent to Congress, <sup>10</sup> and the dam is now under construction. This is one of the detail surveys included in basin-wide study of the Colorado River Basin, Docket No. S-702-102-1, listed above.	\$41,200,000.....	November 1938....	April 1941.
S-702-103-6.....	Bridge Canyon Survey, Colorado River, Ariz., to determine the feasibility of a reservoir for power development, flood control, and river regulation, and silt deposition. Involved are dam site and reservoir surveys, exploration, water supply and economic studies, right-of-way appraisals, preparation of plans, estimates, and report. This survey is one of the detail surveys included in the Colorado River Basin Surveys, Docket No. S-702-102-1, listed above.	To be determined by survey.	June 1941.....	Under way.
S-702-103-6A....	Survey of Bridge Canyon Diversion, Colorado River, Ariz., an alternative to the Parker-Phoenix Aqueduct, to provide supplemental irrigation water to the Phoenix vicinity. Involved are reconnaissance of canal lines, tunnel sites, pumping sites, preliminary surveys, water supplies and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report. This is one of the detail surveys included in Colorado River Basin Surveys, Docket No. S-702-102-1, listed above.	.....do.....	July 1941.....	Do.
S-702-103-7.....	Hassayampa Survey, Lower Colorado Basin, Ariz., to determine the feasibility of irrigating lands in the vicinity of Wickenburg and Wittman, using storage of surface and underground waters. Involved are reconnaissance of reservoir sites, preliminary surveys, land classification, water supply and economic studies, right-of-way appraisals, geologic examinations, and preparation of plans, estimates, and reports.	.....do.....	May 1939.....	Do.
S-702-103-8.....	Fort Mohave Survey, Colorado River, Nev., to determine the irrigation possibilities in southern Nevada by gravity and pumping systems. Involved are preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, preparation of plans, estimates, and report, and cooperation with the Farm Security Administration and the Bureau of Indian Affairs.	.....do.....	June 1940.....	Do.
S-702-103-9.....	Survey of Muddy Creek, Nev., to determine feasibility of developing Muddy Creek for irrigation, flood control, and/or power development.	.....do.....	July 1941.....	Do.
S-702-103-10....	Chino Valley Survey, Granite Creek—tributary of the Verde River—Arizona, to determine feasibility of augmenting the irrigation water supply in Chino Valley for new and supplemental irrigation. Involved are reconnaissance of canal lines, pumping sites, preliminary surveys, water supply, and economic studies, right-of-way appraisals, and preparation of plans, estimates, and reports.	.....do.....	August 1940.....	Do.
S-702-103-11....	Survey of Glen Canyon Diversion, Colorado River, Ariz., an alternative to the Parker-Phoenix Aqueduct, to determine feasibility of providing a supplemental supply of irrigation water to the Phoenix vicinity. Involved are reconnaissance of canal lines, tunnel sites, pumping sites, preliminary surveys, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	July 1941.....	Do.
S-702-104-2.....	Bear River Surveys, Idaho, Utah, and Wyo., to determine irrigation and power requirements, potentialities for extending irrigation development, and possible diversions from Green River. Involved are basin-wide reconnaissance, preliminary surveys, water supply and economic studies, land classification, location of possible reservoir sites, and preparation of report.	.....do.....	July 1937.....	Do.

<sup>10</sup> H. Doc. 185, 77th Cong.

TABLE II.—*Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued*

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF THE INTERIOR—Continued</b>				
<b>Bureau of Reclamation—Continued</b>				
S-702-104-3.....	Malad Valley Survey, Idaho, to determine the feasibility of irrigating lands in the vicinity of Malad, Idaho, using storage of Devil Creek. Involved are dam site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	To be determined by survey.	May 1940.....	Under way.
S-702-104-4.....	Gooseberry-Price River Survey, Utah, to determine feasibility of providing supplemental water for area near Fairview in the San Pitch Basin, and along the Price River near Price, Utah. Involved are reconnaissance of reservoir sites, preliminary surveys, land classification, water supply and economic studies, right-of-way appraisals, geologic examination and dam site exploration, and preparation of plans, estimates, and report.	.....do.....	March 1937.....	Do.
S-702-104-5.....	Truckee-Carson Basin (Washoe) Survey, California and Nevada, to determine possibility of diverting water from Lake Tahoe to Lake Washoe for irrigation of Truckee-Carson area and possible power and flood control benefits. Involved are preliminary surveys, land classification, water supply and economic studies, right-of-way appraisals, geologic examination, preparation of plans, estimates, and report, and cooperation with the War Department.	.....do.....	July 1939.....	Do.
S-702-106-1.....	Survey of Sacramento River and tributaries, near Sacramento, Calif., including reconnaissance, land classification surveys, and water supply and economic studies, to determine irrigation, power, and flood-control possibilities in the Sacramento Basin, and the irrigation demands on Shasta Reservoir.	.....do.....	August 1939.....	Do.
S-702-106-2.....	American River Survey, California, consisting of a basin-wide investigation of storage possibilities and potential irrigation, power, and flood control possibilities. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of report to be coordinated with War Department surveys.	.....do.....	July 1941.....	Do.
S-702-106-3.....	Solano Survey, Sacramento River and tributaries, California, to determine possibilities of irrigation development on Cache and Putah Creeks to provide additional water for the Suisan Bay area. Involved are reconnaissance of possible reservoir sites, diversion sites, canal lines, preliminary surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and reports.	.....do.....	.....do.....	Do.
S-702-106-5.....	Santa Barbara Survey, Santa Maria and Santa Ynez Rivers, Calif., consisting of an investigation of irrigation and water storage possibilities to replenish the ground water of Santa Maria and Santa Ynez Valleys, and for river regulation and flood control. Involved are reconnaissance of possible reservoir sites and canal lines, preliminary surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	.....do.....	Do.
S-702-106-6.....	Chikapudi Survey, Sacramento or Pit Rivers, Calif., to determine possibilities for irrigation development in the area just downstream from Shasta Dam. Involved are reconnaissance of canal lines, preliminary surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and reports.	.....do.....	January 1941.....	Do.
S-702-108-1.....	San Diego County Survey, Colorado and San Diego Rivers, Calif., to determine the feasibility of augmenting the water supply of San Diego County and the city of San Diego. Involved are reconnaissance of diversion sites, canal lines, pumping sites, preliminary surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	July 1941.....	Do.
S-702-110-2.....	Survey of Salmon River (Challis), Idaho, consisting of land classification of the entire Challis Valley of 20,000 acres, studies of reservoir sites, power market, water supplies, and economic characteristics, to determine the most practicable Salmon River diversion for irrigation and possible storage and power sites.	.....do.....	August 1939.....	Do.
S-702-110-3.....	Survey of Mountain Home, Snake River and tributaries, Idaho, including land classification, water supply and economic studies, and reservoir site, canal, and tunnel location surveys, to determine the best plan of supplying water to the area near Mountain Home and possible power development incidental thereto. Included is the possibility of transmountain diversion from the Salmon, Payette, and Boise watersheds.	.....do.....	July 1936.....	Do.
S-702-110-4.....	Survey of Weiser River Basin, Idaho, consisting of detailed investigation including dam foundation exploration, detail topography, geologic examinations, and canal locations; and studies of land classification, economic and water supply characteristics; to develop a plan for conserving Weiser River waters for supplemental irrigation and possible flood control. Included are detail surveys of Cambridge Bench, Docket No. S-702-110-5, Council, S-702-110-8, Mesa, S-702-110-9, and Hornet Creek, S-702-110-10, listed below.	.....do.....	.....do.....	Do.
S-702-110-5.....	Cambridge Bench Survey, Pine and Rush Creeks, tributaries to the Weiser River, Idaho, to determine the storage possibilities involved in using the waters of Pine and Rush Creeks for irrigation development. Involved are dam-site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and reports. This survey, is one of the detail surveys of the Weiser River Survey, Docket No. S-702-110-4, listed above.	.....do.....	.....do.....	Do.
S-702-110-6.....	Lewiston Orchards Survey, Clearwater River, Idaho, to determine the best means of supplying supplemental irrigation water to lands in the vicinity of Lewiston, Idaho. Involved are dam site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	August 1940.....	Do.
S-702-110-7.....	Norwood Survey, Lake Fork, tributary of Payette River, Idaho, to determine feasibility of enlarging present storage facilities to provide supplemental irrigation water. Involved are dam site exploration, canal surveys, land classification, water supply and economic studies, right-of-way appraisals and preparation of plans, estimates, and report.	.....do.....	July 1941.....	Do.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF THE INTERIOR—Continued</b>				
<b>Bureau of Reclamation—Continued</b>				
S-702-110-8.....	Council Survey, Weiser River and tributaries, Idaho, to determine the best plan of irrigating the area on the east side of the Weiser River north of Council. Involved are dam site explorations, canal surveys, land classifications, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and reports. This is one of the detail surveys in the Weiser River Basin survey, Docket No. S-702-110-4, listed above.	To be determined by survey.	July 1936.....	Under way.
S-702-110-9.....	Mesa Survey, Weiser River, Idaho, to determine storage possibilities in the headwaters of Middle Fork of Weiser River to furnish supplemental water to lands in the vicinity of Mesa. Involved are dam site explorations, canal surveys, land classifications, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report. This is one of the detail surveys in the Weiser River Basin survey, Docket No. S-702-110-4, listed above.	.....do.....	.....do.....	Do.
S-702-110-10.....	Survey of Hornet Creek, Idaho, to determine storage possibilities of using the waters of Hornet and Johnson Creeks for irrigation development. Involved are dam site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report. This is one of the detail surveys in the Weiser River Basin Survey, Docket No. S-702-110-4, listed above.	.....do.....	.....do.....	Do.
S-702-110-11.....	Survey of Medicine Lodge Creek, Idaho, to determine feasibility of developing supplemental water supply by construction of a storage reservoir to irrigate the area northwest of Dubois, Idaho. Involved are dam site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	May 1940.....	Do.
S-702-110-12.....	Survey of South Fork of Snake River (Pallides), to determine feasibility of reservoir on Snake River to provide storage for flood control, power development, and new supplemental water for irrigation, cooperating with the War Department. Construction works proposed consist of a dam, reservoir, powerhouse with 30,000 kilowatts capacity, transmission line, and water-saving measures.	\$24,092,000.....	April 1932.....	August 1941.
S-702-110-13.....	Survey of Grande Ronde River, Oreg., to determine feasibility of irrigation development and flood control in the Grande Ronde River, and levees for flood protection. Involved are reconnaissance of reservoir sites, land classification, preliminary surveys, water supply and economic studies, right-of-way appraisals, geologic examination and dam site exploration, and preparation of plans, estimates, and report.	To be determined by survey.	February 1937.....	Under way.
S-702-111-2.....	Bitterroot Survey, Montana, to determine possible storage for new supplemental irrigation, and rehabilitation and extension of present facilities. Involved are dam site explorations and geologic examinations, canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	September 1939.....	Do.
S-702-111-3.....	Yakima River Surveys, Washington, to determine possible irrigation developments in the Yakima River Basin using flood control storage. Involved are reconnaissance of possible reservoir sites, preliminary surveys, land classification, water supply and economic studies, preparation of report, and cooperation with the War Department.	.....do.....	June 1940.....	Do.
S-702-111-4.....	Hanford Survey, Columbia River, Wash., to determine the feasibility of pumping water from the Columbia River to lands south and west of the Columbia River near Hanford and White Bluffs, using Grand Coulee power. Involved are reconnaissance of pumping sites and canal lines, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	March 1941.....	Do.
S-702-111-5.....	Kalispell Survey, Flathead River, Mont., to determine feasibility of supplying irrigation water to the area east and southeast of Kalispell, now devoted to dry farming. Involved are reconnaissance of possible dam site, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	July 1941.....	Do.
S-702-111-6.....	Missoula Valley Survey, Clark Fork, Mont., to determine feasibility of additional irrigation development in Missoula Valley, utilizing pumping and direct diversion. Involved are preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	November 1939.....	Do.
S-702-111-7.....	Kennewick Survey, Columbia River, Wash., to determine feasibility of increasing the irrigated area of the division of the Yakima project by pumping and direct diversion. Involved are preliminary canal line surveys, water supply and economic studies, right-of-way appraisals, land classifications, and preparations of plans, estimates, and reports.	.....do.....	November 1940.....	Do.
S-702-112-1.....	Survey of John Day River and tributaries, Oregon, near The Dalles, including reconnaissance, water right and water supply studies, to determine potential irrigation developments in the basin.	.....do.....	July 1940.....	Do.
S-702-112-2.....	Beaver Creek Survey, Crooked River and tributaries, Middle Columbia Basin, Oreg., to determine storage possibilities on Beaver Creek to supply irrigation water to adjacent lands. Involved are dam-site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	June 1940.....	Do.
S-702-112-3.....	Clear Lake Surveys, White River and tributaries, Middle Columbia Basin, Oreg., to determine the feasibility of augmenting the present supply of irrigation water of Juniper Flats by reservoir storage on the headwaters of Clear Creek. Involved are dam-site explorations, canal surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and reports.	.....do.....	July 1940.....	Do.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF THE INTERIOR—Continued</b>				
<b>Bureau of Reclamation—Continued</b>				
8-702-112-4.....	Pendleton Survey, Umatilla River, Oreg., consisting of an investigation of potential irrigation development in the Umatilla River Basin. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, land classification, water supply and economic studies, dam-site exploration and geologic examination, and preparation of plans, estimates, and report.	To be determined by survey.	September 1940....	Under way.
8-702-113-1.....	Survey of the Willamette River and tributaries, Oregon, near Salem, including reconnaissance of existing irrigation developments in the area, land classification and canal location surveys, and water supply and economic studies including cost estimates for selected projects, to determine feasibility of supplementing water supply to irrigated lands and developing new areas in the valley by flood-control storage and other sources. Included are detail surveys of East Long Tom, S-702-113-2, West Long Tom, S-702-113-3, Tualatin, S-702-113-4, Yamhill, S-702-113-5, and Cottage Grove, S-702-113-6, listed below.	.....do.....	March 1940.....	Do.
8-702-113-2.....	East Long Tom Survey, Willamette River, Oreg., to determine the feasibility of supplementing water supply to irrigated lands and developing new areas in the Willamette River Valley; flood control storage, river regulation, and power development. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report. This is one of the detail surveys included in the Willamette Valley Survey, Docket No. S-702-113-1, listed above.	.....do.....	.....do.....	Do.
8-702-113-3.....	West Long Tom Survey, Willamette River, Oreg., to determine the feasibility of supplementing water supply to irrigated lands and developing new areas in the Willamette River Valley, as well as developing flood control storage, river regulation, and power development. This is one of the detail surveys included in the Willamette Valley Survey, Docket No. S-702-113-1, listed above.	.....do.....	July 1941.....	Do.
8-702-113-4.....	Tualatin Survey, Willamette River, Oreg., to determine the feasibility of irrigating land, using water stored in reservoirs for flood control, river regulation, and power development. This is one of the detail surveys included in the Willamette Valley Survey, Docket No. S-702-113-1, listed above.	.....do.....	January 1941.....	Do.
8-702-113-5.....	Yamhill Survey, Willamette River, Oreg., to determine the feasibility of supplementing water supply to irrigated lands, and developing new areas in the Yamhill River Basin; as well as flood control storage, river regulation, and power development. This is one of the detail surveys included in the Willamette Valley Survey, Docket No. S-702-113-1, listed above.	.....do.....	March 1940.....	Do.
8-702-113-6.....	Cottage Grove Survey, Willamette River, Oreg., to determine the feasibility of supplementing the water supply to irrigated lands and developing new areas in the Willamette River Valley, using storage in reservoirs for flood control, river regulation, and power development. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report. This is one of the detail surveys included in the Willamette Valley Survey, Docket No. S-702-113-1, listed above.	.....do.....	July 1941.....	Do.
8-702-114-1.....	Green-Puyallup Survey, Green River, Wash., to determine feasibility of providing irrigation water for lands now dirt-farmed in the vicinity of Auburn, and reservoirs on the White and Green Rivers for flood control and power development. Involved are reconnaissance of possible reservoir sites and/or pumping sites, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report.	.....do.....	.....do.....	Do.
8-702-116-1.....	Survey of Rogue River in Jackson and Josephine Counties, Oreg., near Grants Pass, including reconnaissance of irrigation systems, soil surveys, run-off and precipitation records, determination of drainage areas and topographical features, water rights and adjudication, and agricultural studies, to determine the feasibility of improvement and extension of irrigation systems. This survey includes Surveys of Medford, Docket No. S-702-116-4, Sams Valley, Docket No. S-702-116-2, and Merlin, S-702-116-3, listed below.	.....do.....	August 1938.....	Do.
8-702-116-2.....	Sams Valley Survey, Rogue River, Oreg., to provide irrigation water for Sams Valley by using storage from reservoir on Rogue River, built for flood control and power development. Involved are reconnaissance and preliminary surveys on canal lines, land classification, water supply and economic studies, right-of-way appraisals, and preparation of plans, estimates, and report. This is one of the detail surveys included in the Rogue River Survey, Docket No. S-702-116-1, listed above.	.....do.....	.....do.....	Do.
8-702-116-3.....	Merlin Survey, Rogue River, Oreg., to determine the feasibility of irrigating lands in the vicinity of Merlin, by storage reservoirs on Grove or Jump-off Joe Creeks, as well as flood control and power development. This is one of the detail surveys included in the Rogue River Survey, Docket No. S-702-116-1, listed above.	.....do.....	.....do.....	Do.
8-702-116-4.....	Medford Survey, Bear Creek, tributary of Rogue River, Oreg., to determine the feasibility of providing supplemental water to lands of the Medford Irrigation District and Rogue River Irrigation District, in cooperation with War Department. Involved are reconnaissance of reservoir sites, preliminary surveys, land classification, water supply and economic studies, right-of-way appraisals, geologic examination and dam-site exploration, and preparation of plans, estimates, and report. This is one of the detail surveys included in the Rogue River Survey, Docket No. S-702-116-1, listed above.	.....do.....	May 1938.....	Do.

TABLE II.—*Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued*

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>DEPARTMENT OF THE INTERIOR—Continued</b>				
<b>Bureau of Reclamation—Continued</b>				
S-702-116-5.....	Talent Survey, Bear Creek, tributary of Rogue River, Oreg., to determine irrigation development and supplemental water supply for Talent Irrigation District. Consideration is being given to enlarging existing Immigrant Gap Reservoir and to construction of other possible reservoirs, as well as to flood control. Involved are reconnaissance of possible reservoir sites, preliminary canal line surveys, land classification, water supply and economic studies, right-of-way appraisals, preparation of contracts with water users, and plans, estimates, and report.	To be determined by survey.	July 1941.....	Under way.
<b>Bureau of Indian Affairs</b>				
S-706-2-1.....	Survey of White Narrows Project, Moapa Indian Reservation, Clark County, Nev. The proposed project includes the construction of dam No. 1 at the White Narrows site, and enlarging dam No. 2 constructed by the Civilian Conservation Corps in 1935. The project will provide flood protection to the agricultural lands of the Moapa Indian Reservation, and a supplemental water supply for lands below the Reservation, as well as making possible a more equitable, economical, and satisfactory distribution of Muddy River water.	\$170,000.....	July 1940.....	December 1941.
S-706-5-1.....	Survey of Standing Rock Reservation, involving irrigation on Indian-owned lands along Grand River, S. Dak.	.....	October 1939.....	Discontinued. <sup>17</sup>
S-706-11-1.....	Survey at Consolidated Ute Reservation, Colo., involving irrigation of lands along Mancos River.	To be determined by survey.	November 1939....	Under way.
S-706-43-1.....	Survey of Buttes dam and reservoir site on the Gila River, San Carlos project. The proposed improvement consists of a storage dam with provisions for the development of hydroelectric power. The improvement would increase the supply of water for irrigation, provide flood protection, facilitate silt removal, and develop electric power, including an increase in the amount of firm power developed at Coolidge Dam.	\$12,230,000.....	July 1940.....	December 1941.
S-706-80-1.....	Survey of the Kliekital unit of Wapato Indian Irrigation Project, Yakima Indian Reservation, Wash. The proposed development consists of a multiple-purpose dam and reservoir project for irrigation and development of hydroelectric power. Water will be provided for irrigation of approximately 30,000 acres in the Toppenish-Simcoe area of the reservation, and for supplemental use for approximately 15,800 acres of non-Indian lands in the Ahtanum Valley. Facilities will be provided for the generation of a maximum of 66,600 kw. of electric power.	\$19,333,800.....	.....do.....	Do.
<b>National Park Service</b>				
S-707-0-1.....	Detailed survey of the recreational resources of the Denison Dam and Reservoir project on the Texas-Oklahoma border, to formulate plans for the most effective recreational use of the area. <sup>18</sup>	To be determined by survey.	August 1941.....	Under way.
<b>DEPARTMENT OF STATE</b>				
<b>International Boundary Commission, United States and Mexico</b>				
S-104-2-1.....	Survey of the Douglas Sanitation Project, on and adjacent to the international boundary at Douglas, Ariz., and Agua Prieta, Sonora, Mexico, consisting of an engineering investigation of sanitation conditions to determine the remedial works needed. The proposed project includes a disposal plant and an outfall line extending from the disposal plant to the international boundary.	\$90,000.....	November 1940....	May 1941.
S-104-41-1.....	Survey of the Rio Grande River between Fort Quitman, Tex., and the Gulf of Mexico, consisting of an engineering investigation and study to determine the feasibility and best means of effecting flood control and water conservation. As one result of this survey a report has been prepared on the Valley Gravity Canal and Storage Project. <sup>19</sup> Further results of the survey will be development of multiple-purpose projects for flood control and irrigation in other parts of the Rio Grande Valley.	To be determined by survey.	October 1938.....	Under way.
S-104-41-2.....	Survey of the Texas-Mexico Border Fence Project, including a field reconnaissance of the proposed fence location along the Rio Grande from Del Rio to the Gulf of Mexico and engineering studies of boundary maps and other available survey data. A report is to be prepared covering a preliminary plan for the project including estimated cost of fence construction.	.....do.....	January 1941.....	Do

<sup>17</sup> Survey incorporated into investigation of Grand River by the Bureau of Reclamation, Docket No. S-702-68-1.<sup>18</sup> Survey carried on with funds appropriated in the 1942 Department of the Interior Appropriation Act, Public Law 136, 77th Cong.<sup>19</sup> Plan preparation and land acquisition now under way for this project.



TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT</b>				
<b>Corps of Engineers <sup>18a</sup></b>				
S-302-1-1	Survey of channel between Isle au Haut and Kimball Island, Maine, in east Penobscot Bay for improvement of Isle au Haut Thoroughfare to provide a channel 6 feet deep, 75 feet wide, and 1,200 feet long through the shoal at the easterly end of the waterway. <sup>20</sup> The locality is wholly dependent upon water transportation and the channel will provide a protected route for the fishing craft that base on Isle au Haut, and for transient commercial and recreational craft.	\$28,000	March 1939	February 1941.
S-302-1-6	Survey of Kennebec River, Maine. Local interests request modification of the existing project to provide a channel 525 to 600 feet wide and 27 feet deep, with minimum radius of 1,500 feet on turns, from Bath to deep water at the mouth of the Kennebec, to facilitate daytime navigation and to permit night navigation. The Navy Department states that naval vessels built and repaired at Bath must use the river in connection with trial runs and delivery of vessels and an adequate channel is of vital interest to the United States Navy. The project recommended because of importance to the national-defense program consists of the improvement of the Kennebec River to provide a channel not less than 500 feet wide and 27 feet deep from the sea to a point 0.6 mile above the bridge at Bath, Maine. The recommended improvement was previously authorized, <sup>21</sup> and no further Congressional authorization is necessary.	\$800,000	January 1940	Do.
S-302-3-1	Survey of Nantucket Harbor, Mass. <sup>22</sup> The recommended project consists of an anchorage area of about 50 acres, 2,800 feet long, 300 to 1,100 feet wide and 15 feet deep on the east side of the harbor opposite the wharves, and a fairway of the same depth extending southward to a point 2,700 feet south of Brant Point. The project is needed to provide additional anchorage facilities to benefit the recreational and sport fishing industry, relieve congestion in the harbor and encourage additional craft to visit the port.	\$63,000 <sup>23</sup>	November 1939	Do.
S-302-3-2	Survey of Hyannis Harbor, Mass. <sup>24</sup> The proposed construction consists of modification of the existing project to provide for a channel 12 feet deep with widths of 150 feet and 100 feet in the Outer and Inner Harbors, respectively; for an anchorage area 12 feet deep and about 3 acres in area, and a jetty 1,000 feet long; to provide for the increased safety of navigation by recreational and fishing craft.	\$125,000 <sup>25</sup>	do	Do.
S-302-3-3	Survey of Marblehead Harbor, Mass. <sup>26</sup> The recommended work consists of the dredging of an anchorage area of 13 acres on the east side of the harbor to a depth of 20 feet, and an area of 16 acres at the southwest end of the harbor to a depth of 9 feet, to provide for additional anchorage and maneuvering space.	\$120,000 <sup>27</sup>	April 1939	Do.
S-302-3-4	Survey of Onset Bay, Mass. Local interests request widening of the inner channel and turning basin and dredging of a channel from the south side of the enlarged basin southward to Shell Cove, to provide additional anchorage space, relieve congestion near the town wharf, and eliminate the danger of collision and groundings. The project recommended by the War Department consists of modification of the existing project to provide for a channel 150 feet wide and 15 feet deep, extending from deep water in the vicinity of Wickets Island to the town wharf at the village of Onset; for enlargement of the 15-foot turning basin at the town wharf; and for an anchorage basin of about 16 acres, contiguous to the proposed channel and turning basin, having a depth of 8 feet.	\$96,000 <sup>28</sup>	November 1940	August 1941.
S-302-3-5	Survey of Duxbury Harbor, Mass. <sup>29</sup> Local interests desire improvement of the channel and basin for the benefit of general commerce and recreational boating, and the construction of breakwaters to protect the basin from storms. The project recommended by War Department consists of modification of the existing project to provide for a channel 8 feet deep and 100 feet wide from its junction with Easterly Channel to the waterfront at Duxbury and for an anchorage basin of 21 acres, 8 feet deep, at Duxbury.	\$106,000 <sup>30</sup>	1939	June 1941.
S-302-3-6	Survey of Danvers River, Mass., involving a field survey of Danvers River in conjunction with a study, including plans and estimates of cost, to determine if improvement of the existing channels is economically justified. The improvement desired by local interests is a channel 100 feet wide and 15 feet deep at mean low water from the mouth of the river to the Water Street Bridge over Waters River, and a channel 80 feet wide and 11 feet deep at mean low water from opposite the mouth of Waters River to the Liberty Street Bridge over Porter River.	To be determined by survey.	June 1940	Under way.

<sup>18a</sup> The surveys listed as under way include only those which have been reported to the Board under Executive Order No. 8455. Prior to the issuance of the Executive order on June 26, 1940, all flood and flood-control surveys conducted by the Corps of Engineers were reported under the provisions of Bureau of the Budget Circular No. 338, issued May 14, 1936. These surveys are now being incorporated into the reporting system set up under Executive Order No. 8455. Because this task of incorporation has not been completed there are many surveys now under way which are not included in the following list. Also, the list does not include preliminary examinations being conducted by the Corps of Engineers, as such investigations are not reported to the Board under Executive Order No. 8455.

<sup>20</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of S. Doc. 15, 77th Cong.

<sup>21</sup> National Defense Rivers and Harbors Act of Oct. 17, 1940, Public Law 668, 76th Cong.

<sup>22</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 115, 77th Cong.

<sup>23</sup> Includes local contribution of \$31,500.

<sup>24</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 98, 77th Cong.

<sup>25</sup> Includes local contribution, not to exceed \$62,500.

<sup>26</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 85, 77th Cong.

<sup>27</sup> Includes local contribution of \$60,000.

<sup>28</sup> Includes local contribution not to exceed \$48,000.

<sup>29</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of S. Doc. 115, 77th Cong.

<sup>30</sup> Includes local contribution not to exceed \$35,000.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
8-302-3-9.....	Survey of Woods Hole and Little Woods Hole Harbor, Mass., involving an economic study of prospective benefits from proposed navigation improvements, and estimated costs of improvements as determined from hydrographic surveys of the harbors.	To be determined by survey.	July 1939.....	Under way.
8-302-3-11.....	Survey of Chatham (Stage) Harbor, Mass. Local interests desire a channel 8 to 12 feet deep and 150 feet wide to provide a safer and shorter entrance to shelter of the harbor. The project recommended by the War Department consists of modification of the existing project to provide a channel 10 feet deep and 150 feet wide.	\$87,000 <sup>21</sup> .....	March 1940.....	August 1941.
8-302-3-12.....	Survey of Weymouth Fore River, <sup>22</sup> Mass., to determine advisability of modifying existing project to provide for widening the 27-foot State-owned channel above Weymouth Fore River Bridge to provide a combined channel and maneuvering basin opposite the ship-building yard for use incident to the launching and outfitting of large naval and commercial vessels and to permit greater freedom of maneuver of tankers at the oil refinery.	\$225,000.....	February 1940.....	March 1941.
8-302-3-18.....	Survey of Gloucester Harbor and Annisquam River, Mass. <sup>23</sup> Local interests desire additional anchorage space in the vicinity of Lobster Cove near the northerly end of the river to relieve congestion, and for the safety of general navigation. The project recommended by the War Department consists of enlargement of the existing anchorage area from 6 acres to 17 acres, 8 feet deep.	\$70,000 <sup>24</sup> .....	do.....	April 1941.
8-302-3-20.....	Survey of Dorchester Bay and Neponset River, Mass. <sup>25</sup> Local interests desire a deeper channel to the head of navigation at Milton Mills and especially a 30-foot channel, 300 feet wide, extending from the Boston Harbor Ship Channel to Commercial Point, to facilitate the movement of refined petroleum products; they also desire modification of the requirements of local cooperation for the 30-foot channel now authorized. The project recommended by the War Department consists of modification of the existing project to eliminate the projected 30-foot channel previously authorized, and to provide a channel 300 feet wide and 25 feet deep from the Boston Harbor main ship channel to Commercial Point.	\$322,400.....	August 1939.....	June 1941.
8-302-3-25.....	Survey of Manchester Harbor, Mass., for navigation. The investigation and report may result in recommendations for channel improvements in Manchester Harbor, including anchorage areas, to provide additional shelter for recreational craft.	To be determined by survey.	July 1939.....	Under way.
8-302-4-1.....	Survey of Taunton River Mass., involving an economic study of prospective benefits from proposed improvements, and estimated costs of improvements as determined from hydrographic surveys of a small anchorage area at Dighton, Mass., and a further economic study to determine the advisability of continuing the improvement to some point below that now authorized by the existing project for improvement of Taunton River.	do.....	May 1939.....	Do.
8-302-4-2.....	Survey of Mystic River, Conn. <sup>26</sup> Local interests desire that project depths be maintained, that the authorized channel be straightened and increased in width, that a turning basin be provided between the bridges, and that an area north of Mason Island be improved for use as an anchorage basin; all in the interest of recreational navigation, business at the shipyards and marine engine plant, to afford suitable access to the marine museum, and to provide a needed protected anchorage for refuge during storm. The War Department notes that project dimensions can be restored under existing authorization, and recommends further improvement to provide a channel 125 feet wide and 15 feet deep from deep water in Fishers Island Sound to mile 2.4 in Mystic River; an anchorage basin of 8.5 acres, 9 feet deep north of Mason Island; and a turning basin 200 feet wide and 400 feet long in the channel at a point 500 feet below the highway bridge.	\$34,000.....	July 1940.....	May 1941.
8-302-4-3.....	Survey of Inner Harbor, Block Island, R. I. Local interests desire the entrance channel to Inner Harbor dredged to 12 feet to 14 feet deep for a width of about 100 feet, and a similar deepening of a small basin in the harbor; to permit deeper draft vessels to enter the harbor and to provide a harbor of refuge. The United States Coast Guard has indicated interest in Inner Harbor as a safe refuge into which it could tow distressed vessels. The project recommended by the War Department consists of improvement of an entrance channel 100 feet wide and 12 feet deep from Great Salt Pond to and including a basin of about 1.4 acres in Inner Harbor.	\$16,000.....	March 1940.....	April 1941.
8-302-4-6.....	Survey of Wickford Harbor, <sup>27</sup> R. I., to determine the advisability of constructing breakwaters for protection of the outer harbor and improving channels and anchorages in Wickford Harbor and Mill Cove. The project recommended by the War Department consists of a channel 10 feet deep and 100 feet wide from the outer harbor to the highway across Wickford Cove with an anchorage basin of 6 acres, 6 feet deep in Wickford Cove, and an entrance channel 10 feet deep and 100 feet wide from the outer harbor into deep water in Mill Cove.	\$44,000.....	April 1940.....	May 1941.

<sup>21</sup> Includes local contribution not to exceed \$43,500.<sup>22</sup> Project included in the pending Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 291, 77th Cong.<sup>23</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 329, 77th Cong.<sup>24</sup> Includes contribution by local interests of one-third of the initial cost.<sup>25</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 394, 77th Cong.<sup>26</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 349, 77th Cong.<sup>27</sup> Project included in the Omnibus Rivers and Harbors Bill, H. R. 5993, based on S. Doc. 105, 77th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-4-7.....	Survey of Pawtuxet River, R. I. Local interests desire the construction of works to prevent flood damages to property and agricultural land in the Pawtuxet Basin. The project recommended by the War Department consists of construction of a levee with appurtenant works to protect the town of Clyde, and the diversion of flood flows of the Pawtuxet River from a point near Pontiac south to Greenwich Bay to protect the lower valley.	\$1,320,000.....	June 1938.....	December 1940.
S-302-4-8.....	Survey of Little Narragansett Bay and Watch Hill Cove, R. I. <sup>13</sup> Local interests request modification of the existing project by the improvement of an anchorage area in Watch Hill Cove to provide suitable accommodations for local and transient recreational craft, and that a channel be maintained through the breach in Sandy Point in lieu of the somewhat longer and circuitous project entrance channel for Pawcatuck River. The project recommended by the War Department consists of a modification of the existing project to provide for an anchorage basin in Watch Hill Cove; for a channel from the mouth of the river to the basin; and for a riprap jetty near the southeast corner of the basin to provide a safe harbor of refuge for many transient small craft as well as local boats.	\$50,000 <sup>14</sup> .....	1939.....	January 1941.
S-302-5-1.....	Survey of Guilford Harbor, Conn. <sup>15</sup> Local interests request a channel through the bar at the entrance into the basin, protected by breakwaters, and deepening of the natural anchorage in the lower East River. The project recommended by the War Department consists of improvement to provide an entrance channel 100 feet wide and 6 feet deep to an anchorage basin of the same depth, 200 feet wide and 1,500 feet long, in East River; and a branch channel in Sluice Creek 60 feet wide and 6 feet deep from the entrance channel to Whitfield Street.	\$50,100 <sup>14</sup> .....	November 1939.....	January 1941.
S-302-5-3.....	Survey of Connecticut River and tributaries, Connecticut, Massachusetts, New Hampshire, and Vermont. <sup>16</sup> Local interests desire modification of the existing project to provide protection against repeated inundations, with their attendant loss to property and of life, by the construction of protective works, especially on the Westfield River and at the towns of West Springfield, Hadley, South Hadley, Hatfield, and Agawan. Recommendations of the War Department consist of modifications in the authorized project for flood control in the Connecticut River Basin to include local works for the protection of four additional localities, <sup>17</sup> as follows: at Springdale, Mass., strengthening and enlargement of an existing dike to provide the same degree of protection being provided by the authorized project at Holyoke; at Riverdale, Mass., construction of a dike with appurtenant works to protect the area from Goldline Brook to Bagg Brook; at Springfield, improvement of the channel of Mill River to supplement the authorized dike project for Springfield; and at Winstead, Conn., improvement of the channel of the Mad River. The recommendations also include, with respect to the previously approved comprehensive flood control plan, <sup>18</sup> that authorization should be granted to make such modifications in the approved system of reservoirs and related flood control works as the War Department deems advisable.	\$1,070,000.....	1938.....	December 1940.
S-302-5-4.....	Survey of Bridgeport Harbor, Conn. <sup>19</sup> Local interests desire modification of the existing project by a 5-foot increase in depth in the present 25-foot anchorage and the existing 26-foot channel, from deep water in Long Island Sound to a point 700 feet below the Stratford Avenue Bridge; and an increase in width of the entrance channel. The project recommended by the War Department consists of the elimination of the 12-foot inner anchorage, the deepening of the channel to 30 feet and widening to 400 feet from Long Island Sound, decreasing to 250 feet at a point about 720 feet below Stratford Avenue Bridge.	\$529,000.....	November 1939.....	January 1941.
S-302-5-10.....	Survey of Housatonic River, Conn., Mass., and N. Y. Local interests desire protection from floods by the construction of reservoirs in the headwaters and local improvements at a number of towns in the flood area. They also desire enlargement of bridge openings, general channel improvement and debris clearance, for the entire watershed. The project recommended by the War Department consists of construction of a reservoir near Thomaston, Conn.	\$5,151,000.....	July 1937.....	June 1941.
S-302-5-12.....	Survey of Connecticut River and tributaries, for flood protection on Gully Brook, Hartford, Conn., consisting of an investigation of justification for flood protection at Gully Brook, a consideration of a plan of reconstruction of the present Gully Brook conduit, and estimates of cost.	To be determined by survey.	September 1941.....	Under way.
S-302-5-13.....	Review of reports on flood control on the Connecticut River and tributaries, consisting of an investigation of various dam sites in the Ammonoosuc Valley, N. H., to determine the advisability of building a substitute flood control project in place of the Sugar Hill Dam and Reservoir on the Ammonoosuc River.	.....do.....	July 1941.....	Do.
S-302-6-5.....	Survey of Hudson River Channel, and Hudson River, N. Y., from upper New York Bay to the southern limit of the State barge canal at Waterford, N. Y., for anchorages in the Hudson River. The survey and report may result in dredging of anchorages for naval vessels in Hudson River.	.....do.....	.....do.....	Do.

<sup>13</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 839, 76th Cong.<sup>14</sup> Includes local contribution of \$20,000.<sup>15</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 149, 77th Cong.<sup>16</sup> Includes local cash contribution of \$25,500.<sup>17</sup> Projects authorized by the Flood Control Act of Aug. 18, 1941, Public Law 228, 77th Cong., on the basis of H. Doc. 724, 76th Cong.<sup>18</sup> Approved by the Flood Control Act of June 28, 1938, Public Law 761, on the basis of H. Doc. 455, 75th Cong.<sup>19</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 819, 76th Cong.

TABLE II.—*Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued*

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-7-3.....	Survey of Cold Spring Inlet, N. J. <sup>45</sup> The proposed project consists of extension of the existing project by dredging a channel 20 feet deep and 300 feet wide from the inner end of the existing project to that depth in Cape May Harbor, a distance of 5,600 feet, to provide a safe and adequate channel for use by U. S. Navy and Coast Guard vessels in reaching their bases in the harbor, and for commercial vessels to reach the inner harbor. The Secretary of the Navy stated <sup>46</sup> that a shoal area approximately 1,200 feet west of the existing pier should also be dredged to 20 feet to facilitate handling of naval vessels at a pier which is planned for that immediate vicinity as a part of the inshore patrol vessel base layout.	\$71,000.....	May 1940.....	May 1941.
S-302-7-4.....	Survey of Wallkill River, N. Y. and N. J., for flood control, involving a topographic survey including cross-sections and subaqueous tests along the lower 4-mile stretch of Quaker Creek, and of an area along a proposed cutoff channel connecting Quaker Creek near Florida, N. Y., with Wallkill River above Pelletts Island Mountain, following the line of McKnight Ditch.	To be determined by survey.	April 1941.....	Under way.
S-302-7-6.....	Survey of Mianus River, Conn., involving an economic study of prospective benefits from proposed navigation improvements, and estimated costs of improvements as determined from a hydrographic survey of the river.	do.....	June 1938.....	Do.
S-302-7-7.....	Survey of Townsend Inlet in Cape May County, N. J. The investigation involves a study of existing and prospective commerce and vessel traffic on the waterway; hydrographic and topographic survey of the water and shores that might be affected by improvement; the preparation of plans and estimates of cost of improvements. The investigation and report may result in channel improvement of the inlet by dredging and the construction of jetties.	do.....	June 1937.....	Do.
S-302-7-8.....	Survey of Toms River, N. J. <sup>47</sup> The proposed project consists of modification of the existing project to provide a channel 12 feet deep and 100 feet wide from Barnegat Bay to the highway bridge over the South Fork, to take advantage of the recommended 12-foot depth in the Intracoastal Waterway, and to reduce transportation costs.	\$141,000.....	August 1939.....	June 1941.
S-302-7-9.....	Survey of Barnegat Inlet, Ocean County, N. J., involving a study of existing commerce and vessel traffic on the waterway, as well as prospective traffic resulting from improvement of the waterway; hydrographic and topographic surveys; and preparations of plans, estimates, and report. The investigation and report may result in increasing the height of the existing stone jetties constructed to insure permanence of the inlet channel.	To be determined by survey.	March 1939.....	Under way.
S-302-7-10.....	Survey of Absecon Inlet, N. J., involving a study of existing and prospective commerce and vessel traffic; hydrographic and topographic surveys; construction and operation of a model of the inlet for studying effects of possible improvements on the nearby beaches; collection of wind, wave, and tidal current data; preparation of plans, estimates, and report. The investigation and report may result in the construction of jetties for insuring permanence of the inlet entrance channel.	do.....	July 1935.....	Do.
S-302-7-11.....	Survey of Delaware and Raritan Canal, N. J., for navigation. Involved are maps showing plans, profile, and cross sections of the canal; investigations of economic conditions within the tributary area and analysis of prospective commerce, savings and other benefits that may be derived from proposed improvements; and engineering studies to determine a plan of improvement to provide a canal for modern barge navigation. The survey and report may result in construction of a barge canal extending from Raritan River to Delaware River.	do.....	June 1938.....	Do.
S-302-7-12.....	Survey of New York Bay-Delaware River section of the Intracoastal Waterway, connecting New York Bay with Delaware River at Bordentown, N. J. The report is to be a comprehensive survey report to determine the necessity and justification for construction of a barge canal across New Jersey, connecting New York Bay with Delaware River. Involved are preparation of topographic maps; investigations of economic conditions, and analysis of prospective commerce, savings, and benefits that may be derived from the proposed canal; and preparation of engineering studies to determine a plan of improvement to provide a canal for modern barge navigation.	do.....	February 1937.....	Do.
S-302-7-13.....	Survey of Way Cake Creek, N. J., for navigation. The investigation and report may result in the dredging of a channel from Raritan Bay to Way Cake Creek, to provide access for fishing and recreational craft.	do.....	May 1936.....	Do.
S-302-7-14.....	Survey of Matawan Creek, N. J., for navigation, involving preparation of a detailed hydrographic map, investigation of economic conditions within the tributary area, and analysis of prospective commerce, savings, and other benefits that may be derived from the proposed improvements. The survey and report may result in dredging of a channel and anchorage area in Matawan Creek.	do.....	April 1936.....	Do.
S-302-7-15.....	Survey of Jones Inlet, N. Y. <sup>48</sup> Local interests desire the provision of a suitable channel from the Loop Causeway Bridge over Long Creek through Jones Inlet and across the ocean bar, with jetty protection on the east, in the interests of safety to navigation, to encourage the development of recreational and freight commerce, and for the benefit of commercial and sports fishing; also to reduce erosion at Point Lookout. The project recommended by the War Department consists of improvement of the inlet by provision of an entrance jetty and a channel 12 feet deep and 250 feet wide through the inlet to the Loop Causeway Bridge.	\$1,800,000.....	September 1940.....	August 1941.

<sup>45</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, based on H. Doc. 262, 77th Cong.<sup>46</sup> Letter to the War Department on Feb. 5, 1941.<sup>47</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, based on H. Doc. 393, 77th Cong.<sup>48</sup> Included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, based on H. Doc. 409, 77th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-7-31.....	Survey of Manasquan River, N. J. <sup>40</sup> Local interests desire deepening of the present channel with widening through the inlet, extension of the jetties, and dredging to a depth of 8 to 10 feet of certain areas for anchorages for the convenience of navigation, and to provide additional anchorage space for recreational craft. The Commandant, United States Coast Guard, has indicated in a letter to the Department that the proposed improvements would be very valuable to the Coast Guard from the standpoint of national defense and has expressed his hope that steps can be taken to assure their early completion. The project recommended by the War Department consists of deepening of the existing Federal channel in Manasquan Inlet, including a slight extension, to 12 feet, except in the reach seaward of the inner end of the north Jetty, where the depth is to be 14 feet; dredging to a depth of 10 feet an anchorage of 19 acres south of the existing project; and dredging to a depth of 12 feet an anchorage 27.5 acres, about 0.5 mile west of the route 35 highway bridge.	\$143,000.....	April 1938.....	June 1941.
S-302-8-1.....	Survey of Rancocas Creek, at Mount Holly, N. J. Local interests desire protection for the town of Mount Holly from damages caused by frequent floods. The project recommended by the War Department consists of improving and rectifying the channel through the town.	\$300,000.....	1937.....	December 1940.
S-302-8-3.....	Survey of the Inland Waterway from Delaware River to Chesapeake Bay, Del. and Md., involving a study of existing and prospective commerce and vessel traffic on the waterway; a hydrographic and topographic survey; a study of the tides and currents through the waterway; and preparation of plans, estimates, and report. The investigation and report may result in the widening of the existing channel throughout the waterway by dredging and dry excavation, and the construction of high-level bridges to replace existing lift bridges.	To be determined by survey.	July 1939.....	Under way.
S-302-8-4.....	Survey of Delaware River, N. J., in the vicinity of Camden. <sup>50</sup> Local interests desire provision of a 37-foot depth from Big Timber Creek to Cooper Point between the easterly line of the authorized deep ship channel and a line 50 feet channelward of the Gloucester-Camden pierhead line and further widening of equal depth to within 50 feet of the bulkhead line in front of the Camden Marine Terminal. The project recommended by the War Department consists of dredging to 37-foot depth a trapezoidal area bounded on the land side by a line 2,880 feet long and 50 feet channelward of the pierhead line in front of the Camden Marine Terminal and bounded channelward by 5,100 feet of the easterly line of the ship channel.	\$373,000.....	March 1940.....	June 1941.
S-302-8-5.....	Survey of Pequest River and its tributaries in Warren and Sussex Counties, N. J., involving a topographic and hydrographic survey of Pequest River between Great Meadows and Long Bridge; the operation over a period of about 15 months of not less than 10 ground water wells, and the operation of nonrecording stream flow gages and maximum stage gages in Pequest River and Bear Creek; and preparation of plans, estimates, and report. The investigation and report may result in channel rectification and enlargement of the present waterway downstream from the "Meadows" area to permit a more rapid run-off of flood waters in Pequest River.	To be determined by survey.	November 1940.....	Under way.
S-302-8-6A.....	Survey of the Delaware River between Philadelphia and the sea. <sup>51</sup> Local interests request that the anchorages at Mantua Creek and Marcus Hook be deepened to 37 feet, lengthened and widened to permit large vessels at anchor to swing clear of the channel and inshore bank, to provide space for foreign vessels arriving in groups under the convoy system, and to remove hazards to navigation. The project recommended by the War Department consists of modification of the existing project at Mantua Creek to provide for an anchorage area 37 feet deep, 1,400 feet wide, and having a mean length of 11,600 feet; and for an anchorage area at Marcus Hook of the same depth and width with mean length of 10,500 feet, both with suitable flared approaches.	\$3,380,000.....	March 1941.....	June 1941.
S-302-9-1.....	Survey for flood control of the Susquehanna River at the U. S. Army Air Depot, Middletown, Pa., involving topographic and soils surveys, flood damage and flood frequency studies, the preparation of plans for flood protection at the air depot with estimates of cost for protective works. The construction of a levee and appurtenant works for the protection of the air depot against floods on the Susquehanna River may result from the investigation and report.	To be determined by survey.	October 1940.....	Under way.
S-302-9-4.....	Survey of Susquehanna River and tributaries, N. Y., Pa., and Md., for flood control. Included are separate investigations for flood control at Lewistown, Canisteo, Chemung, Chenango, Cohocton, Lackawanna, Tioga, and Tioughnioga. The survey involves determination of the desirability of construction of levees, channel improvements, reservoirs, or any practicable measures that may be incorporated in a comprehensive plan for flood control, including power development, for the entire watershed.	do.....	1938.....	Do.

<sup>40</sup> Project included in the Omnibus Rivers and Harbors Bill, H. R. 5993, based on H. Doc. 356, 77th Cong.<sup>50</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, based on H. Doc. 353, 77th Cong.<sup>51</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, based on H. Doc. 340, 77th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
8-302-10-3-----	Survey of Inland Waterway between Rehoboth Bay and Delaware Bay, Del., and Broadkill River, Del., for navigation. <sup>42</sup> Parties interested in improvement of Broadkill River desire deepening of the channel to Milton, with easing of some of the sharper bends and straightening of the entrance at the mouth. Those interested in the development of the Inland Waterway desire deepening from the new Inlet at Delaware Bay to Rehoboth Bay. Those interested in the waters south of the Inland Waterway desire a channel from the Indian River through Rehoboth Bay to the existing canal entrance on the north shore of the bay and a branch channel to a small-boat harbor at Dewey Beach on the northeast shore of Rehoboth Bay. The improvement recommended by the War Department consists of modification of the existing project for the Inland Waterway between Rehoboth Bay and Delaware Bay to provide for extending the jetties at the entrance from Delaware Bay and for a depth of 10 feet in the channel from Delaware Bay to and including the turning basin at Lewes.	\$224,000-----	August 1939-----	May 1941.
8-302-10-7-----	Survey of Nanticoke River, Del. and Md. <sup>43</sup> The improvement recommended by the War Department consists of modification of the existing project to provide a channel 12 feet deep and 100 feet wide from the 12-foot contour in Tangier Sound to the highway bridge at Seaford to permit the more efficient and economical use of larger tankers and freight boats under full load.	\$54,000-----	April 1939-----	March 1941.
8-302-10-16-----	Survey of McCreadys Creek, Md., to determine whether or not anchorage facilities provided under an existing project should be increased.	To be determined by survey.	June 1941-----	Under way.
8-302-10-19-----	Survey of Baltimore Harbor and Channels, Md., including Curtis Creek, consisting of a comprehensive survey report for deep draft navigation from the mouth of Chesapeake Bay to Baltimore, involving topographic and hydrographic surveys to determine cost of construction, investigation of economic conditions within the tributary area, analysis of present and prospective commerce, and engineering studies to determine possible plans of improvement. The investigation and report may result in widening and deepening channels covered by the existing project, construction of a channel across upper Chesapeake Bay, connecting the Chesapeake and Delaware Canal approach channel with the Baltimore Harbor Channel, and the construction of a channel in Curtis Creek, Md.	-----do-----	May 1938-----	Do.
8-302-10-20-----	Survey of Broadwater Creek, Md., for navigation. The investigation and report may result in recommendations for dredging a channel from Chesapeake Bay to the mouth of the creek, and up the creek to a turning basin.	-----do-----	September 1939-----	Do.
8-302-10-21-----	Survey of Manokin River, Md., to determine whether or not a channel should be provided in the river to the town of Princess Anne, Md., involving topographic and hydrographic surveys to determine the cost of construction; investigation of economic conditions in the tributary area; analysis of prospective commerce; and engineering studies to determine the plan of improvement. The investigation and report may result in construction of a channel 7 feet deep and 100 feet wide from the mouth of Manokin River to Locust Point, and thence 7 feet deep and 60 feet wide to Red Bridge at Princess Anne.	-----do-----	May 1940-----	Do.
8-302-11-4-----	Survey of Anacostia River and tributaries, District of Columbia and Maryland, consisting of a comprehensive survey relative to navigation of the Anacostia River, including preparation of topographic and hydrographic maps of the river from its mouth to the vicinity of Bladensburg, engineering studies to determine a plan of improvement for an improved channel to Bladensburg, preparation of cost estimates for possible improvement, and requisite economic studies. The investigation and report may result in the improvement of the Anacostia River from a point 3,000 feet downstream of Magruder Bridge to Bladensburg, a distance of 11,000 feet, to provide for pleasure and commercial navigation.	-----do-----	January 1938-----	Do.
8-302-11-5-----	Survey of Anacostia River and tributaries, District of Columbia and Maryland, consisting of a comprehensive survey report for flood control, including a topographic survey, hydrological investigation, estimates of the magnitude and frequency of floods, and preliminary plans and cost estimates. The survey is to investigate the flood problems in Bladensburg, Edmonston, Colmar Manor, Brentwood, Riverdale, East Riverdale, College Park, Berwyn, and Branchville, and to present a plan for flood protection for these communities in which the construction is economically justified.	-----do-----	July 1938-----	Do.
8-302-12-1-----	Survey of Hoskins Creek, Va., <sup>44</sup> involving modification of the existing project to provide a channel 10 feet deep from that depth in Rappahannock River to the highway bridge $\frac{3}{4}$ mile above the mouth, with widths of 100 feet in the river and 80 feet inside the creek, suitably widened at bends, and a turning basin of the same depth, 250 feet long and 200 feet wide, to permit larger loaded vessels to navigate the channel at all stages of the tide and to eliminate delays and existing hazards to navigation.	\$16,000-----	1940-----	February 1941.
8-302-12-12-----	Survey of channel leading from Oyster, Va., to the Atlantic Ocean. <sup>45</sup> Local interests request a channel 6 feet deep and 60 feet wide from deep water near the south end of Liscombes Channel to a turning basin of the same depth along the water front at Oyster, to eliminate loss of time to boat owners due to unfavorable tides; to increase the waterborne commerce of the port; and to include the establishment of a pound net fishing industry. The improvement is recommended by the War Department as a needed feeder to the proposed inland waterway between Chincoteague Island and Cape Charles.	\$29,000-----	1938-----	January 1941.

<sup>42</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, based on H. Doc. 344, 77th Cong.<sup>43</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, based on S. Doc. 69, 77th Cong.<sup>44</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 129, 77th Cong.<sup>45</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 716, 76th Cong.



TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-12-14.....	Survey of Tangier Channel and Sound, Va. <sup>46</sup> Local interests on Tangier Island request a channel to a turning basin near the south end of the island; also modification of the existing project for Tangier Channel to increase the width and the depth of the channel. The project recommended by the War Department consists of further improvement of the Tangier Channel to provide a channel 8 feet deep and 100 feet wide from the 8-foot contour in Tangier Sound to day marker No. 4, thence 60 feet wide to the town of Tangier.	\$10,100.....	February 1939.....	January 1941.
S-302-12-16.....	Survey of Mattaponi River, Va., consisting only of an investigation of the question of increased depth opposite existing terminals on Mattaponi River at West Point. The area to be covered extends from deep water in York River upstream to a point opposite the uppermost terminal, a distance of about 0.8 mile. Depending upon justification from a Federal standpoint, the existing project may be modified to provide increased depth to facilitate the movements of deeper draft boats to and from the terminals on the Mattaponi River at West Point.	To be determined by survey.	August 1941.....	Under way.
S-302-12-17.....	Survey of Harbors of Cape Charles City, Va., consisting only of consideration of further navigation improvements at and in the vicinity of Cape Charles City. The area to be covered extends from the 20-foot depth contour in Chesapeake Bay into and including the harbors at Cape Charles, a distance of approximately 3 miles. Depending upon justification from a Federal standpoint, the existing project may be modified to provide for increased width and depth in the harbors at Cape Charles City and in the entrance channel leading thereto.	.....do.....	September 1941.....	Do.
S-302-13-2.....	Survey of Lafayette River, Va., consisting of a review of reports to determine the present and prospective use of the upper portion of Lafayette River by pleasure boats, and to determine the amount of present and prospective commerce, if any, on that portion of the river. The existing project may be modified to extend the present channel upstream from the Hampton Boulevard bridge to the 26th St. bridge, with an approximate depth and width of 6 feet and 100 feet respectively.	.....do.....	September 1939.....	Do.
S-302-13-3.....	Survey of James River, Va., consisting of a review of reports to determine a successful plan for eliminating incessant shoaling in the harbor at Richmond, Va., by means of contraction works. Provided that a successful and satisfactory plan of contraction can be evolved, the existing project for James River may be modified to authorize the construction and maintenance of contraction works in the harbor.	.....do.....	March 1939.....	Do.
S-302-13-4.....	Survey of Deep Creek, Warwick County, Va., consisting of a review of reports to determine the present and prospective use of Deep Creek as an anchorage basin, base of operations, and haven of refuge by boats seasonally engaged in tonging oysters on the public oyster grounds in James River in vicinity of the creek; also to determine the amount of present and prospective commerce on the creek. The existing project may be modified to enlarge the present improved anchorage basin to an area of approximately 20 acres, with an approximate depth of 6 feet, or to provide for auxiliary channels of adequate dimensions leading to existing and proposed landings.	.....do.....	May 1940.....	Do.
S-302-13-6.....	Survey of Appamatox River, Va. The investigation is to be confined to the question of eliminating or reducing pollution in the harbor at Petersburg, Va. Depending upon justification from a Federal standpoint, the existing project may be modified to provide a remedial works to eliminate or reduce pollution in Petersburg Harbor.	.....do.....	February 1941.....	Do.
S-302-14-3.....	Survey of Pasquotank River, N. C., for navigation at Elizabeth City. Involved are detailed topographic and hydrographic maps of that portion of the river flowing through Elizabeth City, investigations to determine economic conditions within the tributary area, and a thorough analysis of present and prospective commerce. The investigation and report may result in the addition of channel and wharf facilities for the accommodation and service of commercial and pleasure craft plying the Intracoastal Waterway between Boston, Mass., and Miami, Fla., and the Waterway from Norfolk, Va., to the sounds of North Carolina.	.....do.....	May 1941.....	Survey deferred at request of local interests.
S-302-15-2.....	Survey of Neuse and Trent Rivers, N. C., including a topographic and hydrographic survey of that portion of the Trent River between the shore line at New Bern and the deep-water channel to determine whether modification of the existing navigation project, to provide for a basin at New Bern and access channel thereto is advisable at this time.	.....do.....	March 1941.....	Under way.
S-302-15-7.....	Survey of the Neuse River, N. C., emptying into Pamlico Sound, to determine what measures are warranted to provide protection from floods for local interests in the area between the Johnston County line and New Bern. The project recommended by the War Department consists of the construction of a flood channel cut-off to provide relief for the Goldsboro vicinity.	\$40,000.....	1937.....	May 1941.
S-302-16-2.....	Survey of waterway connecting Pamlico Sound and Beaufort Harbor, N. C., <sup>47</sup> including the dredging of channels to 7 feet deep and 75 feet wide, east and west of Harkers Island and a channel 5 feet deep and 75 feet wide to and including an anchorage basin at Davis, N. C. The improvements will provide shorter and safer routes to and from the fishing grounds and provide a harbor of refuge at Davis.	\$35,000.....	June 1939.....	February 1941.

<sup>46</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 141, 77th Cong.<sup>47</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 99, 77th Cong.

TABLE II.—*Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued*

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-16-3.....	Survey of Inland Waterway, Beaufort to Cape Fear River, N. C., including Wrightsville Beach. <sup>58</sup> Local interests request a channel 12 feet deep and 200 feet wide through Masonboro Inlet, thence 90 feet wide, through Banks and Motte Channels to a turning basin of the same depth at the junction with the Inland Waterway near the Wrightsville Beach bridge, to provide an alternate route to the ocean in case of blocking of the Intracoastal Waterway by mishap to bridges, and a shorter route to the fishing grounds. The project, recommended by the War Department consists of a channel 8 feet deep and 90 feet wide extending from the waterway via Motte and Banks Channels to a point just within Masonboro Inlet at Wrightsville Beach.	\$9,000.....	July 1940.....	June 1941.
S-302-16-12.....	Review of report on Channel from Back Sound to Lookout Bight, N. C., with field investigations and additional studies covering the area in the vicinity of Cape Lookout, N. C., where local interests desire some enlargement of the existing channel. The investigation involves a hydrographic survey of the existing channel, a review and study of the desires and claim of local interests, studies of vessel traffic, of present and prospective commerce, and of the value of an enlarged channel to the U. S. Coast Guard and to the national defense plan. An enlarged channel may be recommended as a result of this investigation.	To be determined by survey.	September 1941...	Under way.
S-302-17-2.....	Survey of Yadkin-Peedee River, N. C. and S. C., to be a combined comprehensive survey report for navigation on the Peedee River to Cheraw, S. C., both with and without the development of hydroelectric power; for extension of navigation facilities from Cheraw, S. C., to the vicinities of Winston-Salem and Charlotte, N. C.; for investigation of storage reservoirs in the interest of flood control and power development at Wilkesboro, N. C., on Yadkin River and at Love's Ford and Crump's Ford on Rocky River, N. C.; for investigation of the complete storage possibilities of the Yadkin River and its tributaries above Wilkesboro, N. C.; and for investigation of reserving a portion of the storage of the Styers hydroelectric project proposed by the city of High Point, N. C., for flood control. The investigation and report may result in the improvement of Peedee River below Cheraw, S. C., for open river navigation; in the canalization of Yadkin-Peedee River above Cheraw, S. C., and in the construction of dams on the Yadkin-Peedee River and its tributaries for the development of hydroelectric power, for flood control, and for augmenting the low-water flow in the navigable channel below Cheraw, S. C.	do.....	June 1938.....	Do.
S-302-17-3.....	Survey of the Intracoastal Waterway in the vicinity of Singleton Swash, S. C., to determine the advisability of modifying that section of the project. The investigation and report may result in the construction of a yacht basin in the Intracoastal Waterway near Singleton Swash and provision for a possible outlet to the ocean.	do.....	June 1940.....	Do.
S-302-18-1.....	Survey of Reedy River, S. C., for flood control improvements. The investigation and report may result in the construction of flood storage reservoirs and in channel enlargement in the vicinity of Orenville, S. C.	do.....	October 1939.....	Do.
S-302-18-2.....	Survey of the Wateree River, N. C. and S. C., for navigation on Wateree River from its junction with Santee River to Camden, S. C., and for possible power developments on Wateree River in South Carolina and North Carolina. The investigation and report may result in the improvement of Wateree River below Camden, S. C., for open river navigation, and the construction of dams on Wateree River for the development of hydroelectric power and for augmenting the low-water flow in the navigable channels below Camden.	do.....	July 1939.....	Do.
S-302-18-3.....	Survey of Santee River, S. C., on the lower Santee River below the Santee Diversion Dam of the Santee-Cooper Project, to determine present conditions, the probable effects of diversion of water from the Santee to the Cooper River, and whether remedial measures should be undertaken to prevent salt water intrusion in the interest of navigation and irrigation, and for the protection and preservation of wildlife. The investigation and report may result in the construction of one or more dams on the Santee River near its mouth to prevent salt water intrusion.	do.....	May 1941.....	Do.
S-302-18-6.....	Survey of Shipyard River, S. C., a tributary of Charleston Harbor, to determine the advisability of modifying the existing project. The investigation and report may result in the enlargement of the existing project to provide 30 foot depth in a $\frac{3}{4}$ mile reach with present project dimensions of 20 feet, and possibly in a further 3,500-foot extension upstream from the head of the existing project.	do.....	August 1941.....	Do.
S-302-19-3.....	Comprehensive survey report of the Edisto River, S. C., for flood control and a coordinated plan of improvement for power development, flood control, and navigation. The investigation and report may result in the improvement of Edisto River below Jacksonboro, S. C., for open river navigation; in the clearing and straightening of natural channels and floodways to facilitate flood run-off; and in the construction of dams on the Edisto River and its tributaries for the development of hydroelectric power, to provide flood storage and to augment the low-water flow in the navigable channel of Edisto River.	do.....	June 1941.....	Do.

<sup>58</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 346, 77th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-20-1	Survey of Savannah Harbor, Ga., consisting of a review of reports involving hydrographic and tide and current surveys of the river, designs and estimates of cost, investigation of present and prospective commerce, and determination of the cost-benefit ratio. The additional improvements that may result from the investigation and report include: (1) Additional jetties at the mouth of the river. (2) A cut between North Channel and South Channel upstream from Fields Cut, and an earthfill dam across the head of South Channel. (3) Widening of the channel in the lower end of Front River. (4) Increasing the depth of the present improved channels and the turning basin above the Seaboard Air Line Railway bridge from 26 feet to 30 feet at mean low water. (5) Extending the improved channel of the harbor from the vicinity of the Atlantic Creaking Company wharf to near the Atlantic Coastal Highway bridge.	To be determined by survey.	January 1938	Under way.
S-302-20-2	Survey of Ogeechee River, Ga., for flood control, involving the determination of the cost and advisability of providing flood protection only to the extent of altering bridges in the basin to prevent interruption of traffic and to improve flow conditions through the bridges.	do	November 1939	Do.
S-302-20-4	Survey of Charleston Harbor, S. C. <sup>58</sup> Representatives of the city of Charleston request improvement of a large water area lying between the Folly Island Channel and the South Channel, southeast of Castle Pinckney and west of Fort Moultrie, to provide a commodious anchorage for the many naval vessels that they believe should be based upon Charleston. The Navy Department states that there is no immediate necessity of additional anchorage area at Charleston; however, it does have an interest in the eventual accomplishment of the project, and is prepared to support it as a national defense project with low priority. The improvement recommended by the War Department consists of the modification of the existing National Defense Project for Charleston Harbor to provide an additional anchorage area 30 feet deep between Castle Pinckney and Fort Moultrie.	\$1,820,000	April 1940	January 1941.
S-302-20-6	Survey of Savannah River, Ga., for flood control, involving the determination of the cost and advisability of providing flood protection in the Savannah River Basin by the construction of reservoirs for regulating the flow to reduce flood heights, the reservoirs to be used for the development of power if economically justified; by the raising of highways and the alteration of bridges. It is possible that a construction project for the Clark Hill Reservoir may develop from this investigation and report.	To be determined by survey.	February 1938	Under way.
S-302-21-1	Survey of Intracoastal Waterway between Charleston, S. C., and St. Johns River, Fla. <sup>59</sup> Local interests request that the portion of Frederica River, Glynn County, Ga., between Buttermilk Sound and Mackay River, not now traversed by the main route of the Intracoastal Waterway, be designated as an alternate route of said waterway to encourage continued use by recreational craft. The Department recommended that the alternate route about 7 miles in length, with channel dimensions of 9 feet in depth and 150 feet in width be included in the existing project.	None	January 1940	December 1940.
S-302-21-2	Survey of Altamaha River, Ga., for flood control, involving the determination of the cost and feasibility of flood protection at Macon, Ga., and in the Altamaha River Basin in general, by constructing levees, raising roads, altering bridges; by constructing reservoirs for regulating the flow to reduce flood heights, the reservoirs to be used for the development of power if economically justified; or by any combination of the above methods.	To be determined by survey.	October 1939	Under way.
S-302-21-3	Survey of Lower Altamaha River and Darien Harbor, Ga., including Rifle Cut, to determine a plan and estimate of cost for deepening and widening Rifle Cut, and to determine the cost-benefit ratio.	do	April 1941	Do.
S-302-22-2	Survey of Suwannee River, Fla., from the Florida-Georgia State line to the Gulf of Mexico, to determine the cost and advisability of providing flood control. Involved are topographic and hydrographic studies of the drainage area and river, geologic, ground water, and dam site investigations, and a study of the tributary area to determine prospective benefits of improvements considered. The investigation and report may result in the construction of a series of dams, with locks or boat lifts, and a hydroelectric power plant at each, and the construction of a cleared floodway and navigation channel about 130 miles long from Ellaville, Fla., to the Gulf.	To be determined by survey.	August 1941	Under way.
S-302-23-1	Survey of St. Josephs Bay, Fla., involving acquisition without cost to the Federal Government of the south channel in the bay leading to Port St. Joe, and its future maintenance with Federal funds. <sup>61</sup> The channel will provide, under Federal control, additional navigation facilities for the convenience and safety of navigation.	No funds required	December 1939	February 1941.
S-302-23-2	Survey of Apalachicola River System, Georgia, Florida, and Alabama, which, with the report, will result in recommendations relative to the advisability of improvement for navigation, water power, flood control, and related uses. The ultimate development of these rivers, if and when justification can be shown, may include navigation from the Gulf of Mexico to Columbus or possibly Atlanta on the Chattahoochee, and Albany on the Flint River, by means of a series of navigation locks and dams. Complete development of the power resources of the Chattahoochee River above Columbus and the Flint River above Albany is also being studied. A measure of flood control at West Point, Ga., and vicinity could be effected by means of a reservoir on the Chattahoochee River a short distance above that point.	To be determined by survey.	April 1929	Under way.

<sup>58</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 156, 77th Cong.<sup>59</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 114, 77th Cong.<sup>61</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of S. Doc. 17, 77th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
8-302-24-1.....	Survey of Intracoastal Waterway between St. Marks River, Fla., and New Orleans, La. The survey may result in modification of the project to provide a greater depth in certain sections of the waterway and in the dredging of easements at sharp turns.	To be determined by survey.	June 1940.....	Under way.
8-302-24-2.....	Survey of St. Marks River, Fla. <sup>43</sup> Local interests desire a channel 15 feet deep at mean low water to St. Marks, with straightening at the mouth of the river and elimination of the bends in the channel near Big Bayou to enable deeper draft vessels to use the river and to facilitate navigation. In addition to some straightening at the mouth, which can be accomplished under the existing project, the War Department recommends the construction of a cut-off at Big Bayou to eliminate three sharp turns, thereby greatly increasing the safety and convenience of use of the channel for general navigation.	\$71,000.....	June 1939.....	June 1941.
8-302-24-3.....	Survey of Intracoastal Waterway from Caloosahatchee River to Apalachicola Bay, Fla., and a barge canal across Florida connecting said Intracoastal Waterway with the St. Johns River, to consist of a review of reports on the above locality, involving topographic and hydrographic surveys, an economic survey covering the Southeastern States, and the preparation of plans and estimates of cost. The investigation and report may result in the construction of an intracoastal waterway, Anclote River, Fla., to St. Marks, and a barge canal across Florida connecting said intracoastal waterway with the St. Johns River, all of suitable depths and widths.	To be determined by survey.	April 1940.....	Under way.
8-302-25-1.....	Review of reports on the Intracoastal Waterway from Choctawhatchee to Pensacola Bay, Fla., including a field survey for a possible channel across Santa Rosa Island to connect Santa Rosa Sound and the Gulf of Mexico; and determination of the economic justification of such a channel.	do.....	January 1941.....	Do.
8-302-26-1.....	Survey of Warrior and Tombigbee Rivers, below Tuscaloosa, Ala. <sup>44</sup> Local interests request that the waterway be further improved below Tuscaloosa by reduction in the number of locks, enlargement of lock chambers, and by cut-offs to improve alignment at several of the many bends. The project recommended by the War Department consists of an improvement of navigation conditions at dam No. 1 by an increase in the spillway capacity.	\$115,000.....	March 1939.....	June 1941.
8-302-26-7.....	Review of reports on Mobile Harbor, Ala. The area under consideration includes the ship channel from the Gulf of Mexico through Mobile Bay to and including the harbor at the mouth of Mobile River. The investigation involves a hydrographic survey to include soundings by fathometer on Mobile Bar and Mobile Bay Channel and cross-sections in Mobile River and Chickasaw Creek. The report may result in a modification of the existing project for Mobile Harbor to provide a greater depth over Mobile Bar and in Mobile Bay Channel, a greater depth and width of channel in Mobile River and Chickasaw Creek, an anchorage basin at the U. S. Quarantine Station, additional widening alongside the Quarantine Station and opposite the Alabama State docks, and widening and deepening in Mobile River opposite the mouth of Chickasaw Creek.	To be determined by survey.	August 1941.....	Under way.
8-302-26-8.....	Survey of Bayou Coden, Ala. A hydrographic and topographic survey will be made by plane table or stadia extending from the mouth of the Bayou to the head of practical navigation approximately 6,500 feet upstream. The report may result in the adoption of a project to provide for a channel in Bayou Coden to accommodate shallow-draft shrimp and oyster boats.	do.....	do.....	Do.
8-302-26-9.....	Survey of the Alabama-Coosa Branch of the Mobile River System, <sup>44</sup> Alabama and Georgia, consisting of a review of previous reports. The project recommended by the War Department consists of further improvement of the Alabama and Coosa Rivers and tributaries for navigation, flood control, power development, and other purposes. The Federal Power Commission has concurred in the recommendations for power development. Estimated cost includes the initiation and partial accomplishment of the plan.	\$80,000,000.....	1939.....	October 1941.
8-302-27-1.....	Survey of Pithlachoscotee River, Florida. Construction proposed by the War Department consists of a channel 6 feet deep from that depth in the Gulf of Mexico to and including a basin 12 miles above the mouth of the river.	\$51,000.....	July 1939.....	December 1940.
8-302-27-3.....	Survey of Withlacoochee River, Fla., to determine the nature of and cost and justification for a plan of improvement for flood control; such improvements or works being necessary to lower maximum flood heights and prevent destructive floods in the Withlacoochee River Basin.	To be determined by survey.	March 1941.....	Under way.

<sup>43</sup> Project included in the pending Omnibus Rivers and Harbor Bill, H. R. 5993, on the basis of H. Doc. 345, 77th Cong.<sup>44</sup> Project included in the pending Omnibus Rivers and Harbor Bill, H. R. 5993, on the basis of H. Doc. 382, 77th Cong.<sup>44</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 414, 77th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
8-302-27-5.....	Survey of St. Johns River, Fla., Jacksonville to the ocean, <sup>45</sup> to determine the advisability of modifying the existing project by widening along the west side of Terminal Channel and along the north side of the channel west of Commodore Point, deepening of the area outside the pierhead line between the highway bridge and Laura St. in the interest and safety of navigation; and protection of shore property at Dames Point and New Berlin against erosion. The local division of the U. S. Naval Reserve requested that a depth of 20 feet be provided in front of the naval armory to permit vessels to reach the wharf and to provide an anchorage area for naval and Coast Guard vessels. The Navy Department recommended that this project be considered essential in the interest of national defense. The improvements recommended by the War Department consist of modification of the existing project to provide for maintenance of the channel widths as they now exist and for further improvement as follows: (a) Widen Terminal Channel between its present westerly edge and the new pierhead-bulkhead line to a depth of 30 feet; (b) dredge to a depth of 28 feet the area between the foot of Laura St. and the Duval County Highway bridge; (c) dredge a navigation and floodway channel 200 feet wide and 26 feet deep, along the south side of the Commodore Point Terminal, terminating in deep water at each end; and (d) dredge an approach and mooring basin 20 feet deep, 1,300 feet long at the 20-foot depth contour and 600 feet long at the pierhead line in front of the Naval Reserve armory in South Jacksonville.	\$725,000.....	July 1937.....	May 1941.
8-302-27-6.....	Survey of Intracoastal Waterway from Jacksonville, Fla., to Miami, consisting of a preliminary examination and review of reports on the locality to determine the cost and advisability of deepening the existing navigation project. Involved is an economic survey of 20 eastern and south-central Florida counties, and the preparation of plans and estimates of cost largely from field survey data already available. The investigation and report may result in deepening the existing 8-foot channel from Jacksonville, Fla., to Miami, to a depth of 10 or 12 feet.	To be determined by survey.	June 1941.....	Under way.
8-302-27-7.....	Survey of waterway from Crescent Lake, Fla., by way of Haw Creek to Bennell, thence by way of a land cut to the Intracoastal Waterway at Flagler Beach, consisting of a preliminary examination and survey of the locality, involving a topographic and hydrographic survey, an economic survey of 7 counties, and the preparation of plans and estimates of cost. The report and investigation may result in the construction of a waterway 8 feet deep from Lake Crescent, Fla., to the Intracoastal Waterway at Flagler Beach.	.....do.....	January 1939.....	Do.
8-302-27-8.....	Survey of channel from Sanford to Indian River near Titusville, Fla., to connect St. Johns River with Indian River, consisting of a review of reports on the locality. Involved is an economic survey of 11 northeastern and central Florida counties, and the preparation of plans and estimates of cost largely from field data already available. The investigation and report may result in the construction of locks, dams, and a combination flood-control and shallow-draft navigation canal connecting the St. Johns River near Sanford with the Indian River near Titusville.	.....do.....	March 1937.....	Do.
8-302-27-10.....	Survey of Ponce de Leon Inlet, Fla., consisting of a review of reports on the locality and involving a topographic and hydrographic survey of the inlet, an economic survey of Volusia County, Fla., and the preparation of plans and estimates of cost. The investigation and report may result in the construction of a navigation channel suitable for small craft, extending from the Atlantic Ocean through the inlet to the Intracoastal Waterway, and such channel stabilizing works as may be necessary.	.....do.....	May 1938.....	Do.
8-302-27-11.....	Survey of Canaveral Harbor, Fla. <sup>46</sup> Local interests have sponsored a proposal to provide a deep water harbor on the shore of Canaveral Bight and request an entrance channel 30 feet deep leading from Canaveral Bight through the barrier beach to a turning basin in Banana River, with a tributary canal connecting with the Intracoastal Waterway in Indian River. The Navy Department recommended a deep-water harbor at either Canaveral or Eau Oalila as being desirable. The improvements recommended by the War Department consist of a turning basin 27 feet deep and 1,000 feet wide with an average length of about 1,900 feet, located near the easterly shore of Banana River and inclosed by a dike; an entrance channel 27 feet deep and 300 feet wide extending from the turning basin to deep water in Canaveral Bight, protected at its seaward entrance by jetties to the 12-foot depth contour; a barge canal 8 feet deep and 100 feet wide from the turning basin to the Intracoastal Waterway; and a lock 50 feet wide and 250 feet long at a suitable point on the barge canal.	\$1,661,000 <sup>47</sup> .....	October 1939.....	June 1941.
8-302-27-16.....	Survey of St. Augustine Harbor, Fla., consisting of a review of reports on the locality to determine the cost and advisability of further improvement at the present time. Involved are topographic and hydrographic surveys of the vicinity, hydraulic and shore line studies, and a study of the tributary area to determine prospective benefits of the improvements considered. The investigation and report may result in the construction of an extension to the existing sand-trap groin and the construction of a jetty southward of the new entrance channel.	To be determined by survey.	August 1941.....	Under way.

<sup>45</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 322, 77th Cong.<sup>46</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 367, 77th Cong.<sup>47</sup> Includes local contribution of not to exceed \$850,000.

TABLE II.—*Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued*

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-27-18.....	Survey of St. Johns River, Fla., Jacksonville to Lake Harney, consisting of a review of reports on the locality to determine if improvement in the interest of navigation is advisable at this time. The work includes a hydrographic survey of a cut-off channel via Woodruff Creek between Sanford and Lake Harney, and a study of its tributary area to determine the benefits resulting therefrom.	To be determined by survey.	September 1941....	Under way.
S-302-27-19.....	Survey of Sebastian Inlet, Fla., consisting of a review of the report on the locality, <sup>68</sup> to determine the advisability of modifying the recommendation in the report. Involved is a hydrographic survey of the inlet and vicinity, and a study of the tributary area to determine the prospective benefits of the improvements considered. The investigation and report may result in the construction of a navigation channel 8 or 10 feet deep from the Atlantic Ocean through the inlet to the Intracoastal Waterway in the Indian River.	.....do.....	October, 1941.....	Do.
S-302-27-21.....	Survey of Eau Gallie Inlet, Fla., consisting of a review of reports on the locality to determine if improvement in the interest of navigation is advisable at the present time. Involved is a study of the tributary area to determine prospective benefits, and the preparation of plans and estimates of cost. The investigation and report may result in the construction of a channel 10 feet deep from the Atlantic Ocean through the barrier beach to Indian River, or a channel of such greater depth as may be required by vessels attached to the United States naval air station on Banana River and the Melbourne-Eau Gallie Airport.	.....do.....	November 1941....	Do.
S-302-28-1.....	Survey of Hillsboro River, Tampa, Fla., <sup>69</sup> involving the deepening of the channel to 9 feet from the upper end of the existing project to a point 2,000 feet above the Michigan Ave. Bridge, and a cleared channel thence to the Florida Ave. Bridge, to provide adequate depth for existing and prospective navigation.	\$60,000.....	July 1939.....	February 1941.
S-302-28-2.....	Survey of Alafia River, Tampa, Fla., <sup>70</sup> involving acquisition and improvement of the existing channel and turning basin to permit safe entrance of vessels of 24 feet draft and effect substantial savings in transportation costs.	\$189,000.....	December 1935....	December 1940.
S-302-28-5.....	Survey of Tampa Harbor, Fla., consisting of a review of reports on the locality, involving an economic survey of 18 central and midwestern counties of Florida, and the preparation of plans and estimates of cost from field survey data already available. The investigation and report may result in the widening of several channels for navigation in upper Tampa Harbor.	To be determined by survey.	December 1939....	Under way.
S-302-29-1.....	Survey of Caloosahatchee River and Lake Okeechobee drainage areas, Fla., consisting of a review of reports on the locality to determine if the existing multiple-purpose project for navigation, flood control, drainage, and irrigation should be modified. Involved are topographic and hydrographic surveys of drainage canals around Lake Okeechobee; studies of hurricane winds and the tides and waves produced thereby; of flood damage due to wind and water; studies of various methods for control of water levels in the lake, including the advisability of raising, strengthening, and extending the present levee system; an economic survey of 7 south-central Florida counties bordering the lake, and the preparation of plans and estimates of cost. The investigation and report may result in the construction of a lock and an enlarged floodway channel in the Caloosahatchee River, enlarged floodway channels and adequate water conservation works in Fisheating Creek, Indian Prairie Canal, and Harney Pond Canal, and protective dikes or levees along the west shore of Lake Okeechobee and around Kreamer, Torry, and Ritta Islands.	.....do.....	February 1939.....	Do.
S-302-29-2.....	Survey of Caloosahatchee River and Lake Okeechobee drainage areas, Kreamer, Ritta, and Torry Islands, Fla., consisting of a review of reports on the locality and involving a topographic survey of the islands, an economic survey to determine present and prospective values of property thereon, and the preparation of plans and estimates of cost. The investigation and report may result in the construction of levees or other protective works around Kreamer, Ritta, and Torry Islands in Lake Okeechobee.	.....do.....	January 1941.....	Do.
S-302-29-3.....	Survey of Caloosahatchee River and Lake Okeechobee drainage areas, Florida, side channels at Fort Myers, Pahokee, and Stuart, consisting of a review of reports on the locality. Included are a topographic and hydrographic survey of proposed sites between Stuart and Fort Myers, Fla., an economic survey of 5 south-central Florida counties, and the preparation of plans and estimates of cost. The investigation and report may result in the construction of side channels 8 feet deep and suitable turning basins at Fort Myers, Pahokee, and Stuart.	.....do.....	May 1940.....	Do.
S-302-29-4.....	Survey of Caloosahatchee River, Fla., from Fort Myers to the Gulf of Mexico, consisting of a review of reports on the locality and involving a topographic and hydrographic survey of the river from Fort Myers to the 25-foot contour in the Gulf of Mexico, an economic survey of 5 southern Florida counties, and the preparation of plans and estimates of cost. The investigation and report may result in an enlargement of the existing channel for navigation in the Caloosahatchee River between Fort Myers and the Gulf sufficient to accommodate coastwise and ocean-going steamships.	.....do.....	June 1936.....	Do.

<sup>68</sup> Unfavorable report submitted on Aug. 5, 1941, to the House of Representatives Committee on Rivers and Harbors.<sup>69</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 119, 77th Cong.<sup>70</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of S. Doc. 16, 77th Cong.



TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-29-5	Survey of St. Lucie Inlet and River, Fla. <sup>71</sup> Local interests request a channel 10 feet deep and 200 feet wide from the ocean through the inlet; thence 8 feet deep and 100 feet wide to the Intracoastal Waterway, to eliminate loss of time to boats having to await favorable surf conditions and to enable larger commercial fishing and recreational boats to use the inlet; also removal of the shoal in the North Fork or construction of a bypassing channel. The improvement recommended by the War Department consists of modification of the existing project to provide for a channel 200 feet wide and 10 feet deep across the outside rock reef at the seaward entrance to the inlet.	\$46,000	February 1940	July 1941.
S-302-30-2	Survey of Waterway from Miami to Key West, Fla., Cross Bank to Key West section, consisting of a review of reports on the locality to determine if improvement of the waterway is advisable at the present time, and involving a topographic and hydrographic survey of alternative routes for the waterway, an economic survey of Dade and Monroe Counties, Fla., and the preparation of plans and estimates of cost. The investigation and report may result in the construction of a protected waterway from Cross Bank, Florida Bay (near Tavernier), to Key West, Fla., in extension of the existing Intracoastal Waterway, Miami to Florida Bay.	To be determined by survey.	July 1941	Under way.
S-302-30-4	Survey of Miami River, Fla., consisting of a review of reports on the locality, and involving a topographic and hydrographic survey of the river from the mouth upstream to its intersection with the Miami Canal, an economic survey of Dade County, Fla., and the preparation of plans and estimates of cost. The report and investigation may result in the construction of two access channels 15 feet deep in Biscayne Bay connecting with the mouth of the Miami River, and a harbor of refuge 8 feet deep and 50 acres in extent in or near Miami.	do	September 1940	Do.
S-302-30-5	Survey of Lake Worth Inlet, Fla., consisting of a review of reports on the locality, and involving a topographic and hydrographic survey of the inlet and vicinity, a study by the Shore Protection Board of possible shore line changes, an economic survey of four southeastern Florida counties, and the preparation of plans and estimates of cost. The investigation and report may result in the deepening of the existing channel and turning basin in Lake Worth Inlet to 25 feet.	do	June 1937	Do.
S-302-30-8	Survey of Miami Harbor, Fla., consisting of a review of report <sup>72</sup> and involving economic studies to determine the advisability of additional improvements in the interest of air commerce and national defense, and preparation of plans and estimates of cost. The investigation and report may result in the construction of a combined seaport, airport, and naval anchorage adjacent to Virginia Key in Biscayne Bay.	do	October 1941	Do.
S-302-31-2	Survey of Flint Creek and its branches in Morgan County, Ala., involving studies of damage caused by floods, feasibility and cost of possible corrective works, and economic analysis, which may result in a channel rectification project.	do	1939	Do.
S-302-32-1	Survey of Cumberland River Basin, Ky., and Tenn., which will result in recommendations relative to the advisability of improvements for navigation, flood control, and related subjects.	do	1939	Do.
S-302-32-2	Survey of Yellow Creek, Ky., and Tenn., for flood control, with detailed study of the flood plain in the vicinity of, and downstream from Middlesborough, Ky.	do	May 1941	Do.
S-302-32-3	Review of report on Cumberland River, Ky. and Tenn., <sup>73</sup> involving hydrographic surveys of certain shoals in Cumberland River, channel lay-out and estimates, and navigation, economic, and general studies. The investigation will result in recommendations on the advisability of providing a nine-foot channel in Cumberland River.	do	do	Do.
S-302-32-4	Survey for flood protection at Lebanon, Tenn., consisting of a flood-control study involving certain instrumental surveys in the flood plain of Town Creek, studies of damage caused by floods, feasibility and cost of possible corrective works, and economic analysis. The survey may result in construction of flood control dam or channel rectification.	do	July 1941	Do.
S-302-33-4	Survey of Allegheny and Monongahela Rivers and tributaries, Pennsylvania, New York, Maryland, and West Virginia involving the feasibility and economy of improvement for navigation, flood control, water power, and irrigation, including the possibility of coordinating any or all of these several uses, together with incidental features. Pertinent data regarding low-water regulation will be developed in the investigations relating to reservoir projects.	do	July 1939	Do.
S-302-33-5	Survey of Kiskiminitas and Conemaugh Rivers, Pa., to Johnstown, Pa., as to possibilities of canalization, and involving a determination of engineering feasibility and economic desirability.	do	July 1940	Do.
S-302-33-8	Ohio River pollution survey consisting of a comprehensive investigation of the various problems relating to stream pollution and measures for its prevention and abatement in the Ohio River Basin. The report will present data on the nature and extent of pollutive wastes being discharged into the streams, and the most feasible methods of correcting the polluted conditions, and will also present recommendations for any needed remedial legislation.	do	1939	Do.
S-302-33-10	Survey of Cheat River, W. Va., for flood control and multiple purpose development. The investigation and report may result in recommendations for construction of multiple purpose reservoirs for flood control and power, as part of a comprehensive plan of development for the basin.	do	March 1938	Do.

<sup>71</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 391, 77th Cong.<sup>72</sup> H. Doc. 470, 76th Cong.<sup>73</sup> H. Doc. 38, 73d Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-33-11.....	Survey of Clarion River, Pennsylvania, for flood control and multiple purpose development. The investigation and report may result in recommendations for construction of reservoirs for flood control, power, navigation, pollution, and water supply.	To be determined by survey.	March 1938.....	Under way.
S-302-34-1.....	Survey of Beaver River and tributaries, Pennsylvania and Ohio, for a comprehensive plan of development for navigation, flood control, water power, and irrigation, including the possibility of coordinating any or all of these several uses, together with incidental features. Pertinent data regarding low-water regulation are being developed in the investigations relating to reservoir projects.	.....do.....	January 1939.....	Do.
S-302-34-2.....	Survey of canal to connect Lake Erie with the Ohio River, reach from Ohio River to Struthers, Ohio, via Beaver River, Pa., and the Mahoning River, Pa., and Ohio. <sup>73</sup> Local interests request improvement of the Beaver River and of the Mahoning to Struthers, Ohio, about 6 miles below Youngstown and 35 miles above the mouth of the Beaver. The project recommended by the War Department consists of improvement of the Beaver and Mahoning Rivers to provide a channel 12 feet deep from the mouth of the Beaver to Struthers, with a width of 250 feet in the Beaver and 200 feet in the Mahoning, by the construction of dams and dredging.	\$57,751,000.....	June 1940.....	August 1941
S-302-35-1.....	Survey of Chestnut Creek, Va., involving preliminary topographic surveys and foundation investigations, hydraulic studies, preliminary design and cost estimates, and economic studies necessary to develop general plans for a flood control improvement or improvements on Chestnut Creek.	To be determined by survey.	January 1941.....	Under way.
S-302-36-1.....	Survey of Muskingum River Basin, Ohio, to determine the advisability and cost of a new system of navigation locks and dams on Muskingum River and of certain flood control projects on tributary streams.	.....do.....	July 1938.....	Do.
S-302-37-1.....	Survey of Scioto River Basin, Ohio, involving the effect which remedial measures in the basin would have on Ohio River and Mississippi River floods, and of costs and benefits to be derived from construction of reservoirs and protective works to provide for flood protection at the various damage centers, both agricultural and urban, throughout the area. The plan of development may include construction of 3 reservoirs and of local protection works at one urban locality.	.....do.....	January 1938.....	Do.
S-302-39-1.....	Review of report of Big Sandy River and Tug and Levisa Forks, W. Va. and Ky. The investigation involves an initial economic survey of prospective commerce and savings to establish the economic justification of a new 9-foot canalization project on Big Sandy River and Tug and Levisa Forks, hydrographic and topographic surveys, detailed dam site surveys, foundation explorations, detailed flowage appraisals, preliminary design and cost estimates, and final economic studies necessary to develop general plans for the improvement.	.....do.....	January 1941.....	Do.
S-302-40-1.....	Survey of Salyersville, Licking River, Ky. <sup>74</sup> Local interests desire protection from floods by means of a diversion cut-off across the throat of the bend upon which the town is located and by channel improvement. The project recommended by the War Department consists of protection for Salyersville by means of levees, with a pumping plant for evacuation of interior drainage.	\$174,000.....	April 1938.....	March 1941.
S-302-42-3.....	Flood-control survey of Wabash River and tributaries, Indiana, and Illinois, including the Mississinewa River and tributaries, Indiana; consideration to be given methods of control, including levees, channel rectification, diversion, and reservoirs.	To be determined by survey.	March 1941.....	Under way.
S-302-43-1.....	Flood-control survey of Salt River, at Taylorsville, Ky., to include preparation of plans and preliminary design of local protection works, and consideration of possible reservoir sites on Salt River and its tributaries above Taylorsville.	.....do.....	May 1941.....	Do.
S-302-44-1.....	Survey of coasts of the Great Lakes with a view to the establishment of harbors of refuge for light-draft vessels. Involved are topographic and hydrographic surveys with plans and estimates at Whitefish Point, Little Lake, Big Bay, L'Anse, Grand Traverse Bay, Lac LaBelle, Eagle Harbor, Carvers Bay, Black River, Brule River, Amnicon River, Knife River, Beaver Bay, Two Islands, Tofte, Lutsen and Grand Portage Harbors on the southerly and northwesterly shores of Lake Superior, and Grace and Chippewa Harbors on Isle Royale, Lake Superior; Epoufette, Naubinway, Point Detour, Cedar River, South Milwaukee, Highland Park, Gary, Ind.; Dunes State Park, New Buffalo, Leland, Sturgeon Bay (Mich.) and St. James (Beaver Island) Harbors at the northerly and southerly ends and on the west shore of Lake Michigan; Port Sanilac, Port Austin, Point Lookout, Oscoda, Harrisville, Rogers City, and Hammond Bay Harbors on the westerly shore of Lake Huron; West Sister Island, Barcelona, Cattaraugus Creek, Grand View Bay, and Big Sister Creek Harbors on the southerly shore of Lake Erie; and Wilson, Oak Orchard, Pultneyville, Port Ontario, North Pond and Giff (Galloo Island) Harbors on the southerly and easterly shores of Lake Ontario.	.....do.....	December 1940.....	Do.
S-302-44-2.....	Survey of Grand Marais Harbor, Minn., involving hydrographic, topographic and probing surveys with plans and estimates. The report may result in the construction of an interior harbor for small vessels.	.....do.....	.....do.....	Do.

<sup>73</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 178, 76th Cong.<sup>74</sup> Project authorized by Flood Control Act of Aug. 18, 1941, on the basis of H. Doc. 261, 77th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-44-3.....	Survey of Ashland Harbor, Wis. <sup>78</sup> Local interests request deepening to 21 feet of an area about 2,000 feet wide for a maximum distance of 4,000 feet, between the 400 feet wide portion of the harbor and deep water in the bay in the westerly portion of the harbor, and the removal of a shoal which lies east of the east basin, and deepening to 25 feet of a portion of the shoal area, in the interest of safety and for the convenience of navigation. The Lake Carriers Association proposes if the west portion of the harbor be not improved as requested by local interests, that the 400-foot channel be widened at its westerly end to 750 feet. The improvement recommended by the War Department consists of modification of the existing project to provide for widening of the 400 foot channel to afford a channel 400 feet wide at its easterly end gradually flared to a width of 750 feet at its westerly end, all at a depth of 21 feet.	\$24,000.....	July 1940.....	June 1941.
S-302-44-5.....	Survey of harbor at Knife River, Minn., consisting of a comprehensive survey report on the needs for a harbor for light draft fishing and recreational vessels. Involved are detailed topographic, hydrographic, and probing surveys, economic investigation of commercial shipments of fish, and engineering studies to determine the most feasible and economical improvement to provide a small-boat harbor. The investigation may result in the construction of an entrance channel and an interior harbor basin with a depth of about 10 feet to accommodate small vessels and to act as a harbor of refuge for cruising craft.	To be determined by survey.	June 1939.....	Under way.
S-302-44-6.....	Survey of Agate Bay Harbor, Minn., for navigation to determine the advisability of modifying the existing project at this time. Involved are detailed topographic and hydrographic field surveys, additional subsurface probings, engineering studies, and consultation with navigation interests to determine the proper plan of improvement. The investigation and report may result in the construction of a new east breakwater, and the removal of the present east breakwater at Agate Bay Harbor.	do.....	October 1941.....	Do.
S-302-45-2.....	Survey of Waukegan Harbor, Ill., <sup>79</sup> involving modification of the existing project to provide for a depth of 22 feet from that depth in Lake Michigan to the outer end of the north pier, in the interest of greater safety and convenience of navigation of the larger freighters using the harbor; for the abandonment of the present provision for dredging to 18 feet the triangular area in the southwest corner of the inner basin, and for the improvement of an area in the southwest corner of the inner basin to a depth of 8 feet to provide anchorage for light draft vessels.	\$34,000.....	April 1938.....	February 1941.
S-302-45-4.....	Review of reports on the Grand Calumet River, Ill. and Ind., and review of reports on the Calumet-Sag Channel, Ill., and the Indiana Harbor Canal, Ind. Involved are topographic and hydrographic surveys of the areas adjacent to the waterways together with plans and estimates of cost. The construction project that may result from the investigation and report consists of the following improvements which were requested by local interests: (1) Extension of the barge channel in the Grand Calumet River, <sup>77</sup> from the Indiana Harbor Canal eastward to Cline Avenue, a distance of 2 miles; (2) relocation of the single lock in Little Calumet River, <sup>77</sup> and substitution of two locks, one in the Calumet River and one in Indiana Harbor Canal.	To be determined by survey.	June 1939.....	Under way.
S-302-45-5.....	Survey of Wilmette Harbor, Ill., involving topographic and hydrographic surveys of the areas adjacent to the existing harbor together with plans and estimates of cost. The construction project requested by local interests, which may result from the investigation and report, is an enlarged small boat harbor.	do.....	March 1936.....	Do.
S-302-45-7.....	Survey of Manistee Harbor, Mich. <sup>80</sup> Local interests request modification of the existing project to provide for the safe passage of the larger vessels now using the harbor, to prevent erosion of the shore and to reduce maintenance dredging. The improvements recommended by the War Department consist of the removal of the south revetment, the construction of about 900 feet of new pier and revetment south of and parallel to the existing north pier and revetment, and widening of the river entrance channel to 250 feet with a depth of 21 feet, extending about 100 feet upstream from the outer harbor basin.	\$147,000.....	March 1940.....	June 1941.
S-302-45-8.....	Survey of Milwaukee Harbor, Wis., to determine if additional works are needed to prevent rough water conditions in the outer harbor at the municipal slip and piers and also to determine the possibility of providing a yacht harbor by additional works at the north end of the outer harbor. The investigation and report may result in the removal of a portion of the existing breakwater, and the construction of additional exterior breakwater protection and also a yacht harbor.	To be determined by survey.	April 1936.....	Under way.
S-302-45-10.....	Survey of Fox River, Wis., to determine if the necessary repair work on the locks and other navigation facilities maintained on the Fox River, and any construction or improvement work on the river advisable in the interests of navigation, may be performed by War Department employees, employed in the maintenance and operation of navigation facilities on the river, in such manner as to provide such employees with continuous employment throughout the year.	do.....	July 1940.....	Do.
S-302-45-12.....	Survey of Michigan City Harbor, Ind., involving review of reports, to determine the advisability of modifying the existing navigation project at this time. This survey may result in the further deepening of the outer harbor and Trail Creek at Michigan City, Ind.	do.....	March 1941.....	Do.

<sup>78</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 337, 77th Cong.<sup>79</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 116, 77th Cong.<sup>80</sup> As recommended in H. Doc. 145, 76th Cong.<sup>81</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 380, 77th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-45-13.....	Review of survey report on Holland Harbor and Black Lake (Lake Macatawa), Mich., to determine if extension of the existing Federal navigation project is advisable at the present time. The investigation and report may result in extending the present navigation project upstream about 2,500 feet.	To be determined by survey.	May 1941.....	Under way.
S-302-45-16.....	Survey of Racine Harbor, Wis., consisting of review of survey report to determine the advisability of modifying the existing project so that the proposed dredging of the Root River will not extend above a point of 200 feet below the 4th St. Bridge. Involved are engineering studies to determine what effect the desired modification will have on the cost of completing the existing project, present and prospective commerce, and other benefits. The investigation and report may result in eliminating the dredging of about 100 linear feet of channel in Root River at the upstream end of the authorized project.	do.....	June 1941.....	Do.
S-302-45-17.....	Survey of Chicago River, Ill., North Branch, north of North Ave., consisting of a review of reports to determine the advisability of providing any improvement in the North Branch, north of North Ave. The investigation and report may result in deepening the North Branch of the Chicago River between the approximate limits of North Ave. and Irving Park Rd., Chicago.	do.....	July 1941.....	Do.
S-302-45-23.....	Survey of Oconto Harbor, Wis., to determine the advisability of restoring the project depth in the harbor at this time. The investigation and report may result in dredging the entrance channel and turning basin to full project depth of 15 feet, and extensive rebuilding or repairing of the south pier to improve the harbor for deep-draft navigation.	do.....	October 1941.....	Do.
S-302-46-1.....	Survey of Sebewaing Harbor and River, Mich., to determine if improvement in the interest of commerce and navigation is advisable at this time. Involved are topographic and hydrographic surveys with plans and estimates. The investigation and report may result in deepening the harbor entrance channel from Saginaw Bay into Sebewaing River.	do.....	December 1940....	Do.
S-302-46-3.....	Survey of Great Lakes Ship Channels, Lock at St. Marys Falls on St. Marys River. <sup>79</sup> Shipping interests request the construction of a new lock about 860 feet long, 80 feet wide, and 30 feet deep on the site of the new unserviceable Weitzel Lock. The project recommended by the War Department consists of a lock 800 feet long, 80 feet wide, and 30 feet deep with approach channels 27 feet deep, to supplement the existing Davis and Fourth Locks.	\$8,000,000.....	February 1941.....	March 1941.
S-302-46-4.....	Survey of Sault Ste. Marie Power Plant, St. Marys Falls, St. Marys River, Mich. The War Department recommended that improvements consist of replacement of the existing Government plant to assure a dependable source of power for operation of the locks and for utility service in the adjacent area. Reconstruction would be undertaken with a view to develop ultimately all available power by the Federal Government in one 45,000-kilowatt plant located north of the locks and at the foot of the falls; to be constructed in two stages, the first stage to consist of an installation of 14,000 kilowatts; and the second stage to consist of the completion of the plant, or the acquisition and reconditioning of the Michigan Northern Power Co.'s plant at the expiration in 1944 of the Company's present lease with the Government.	\$10,000,000 <sup>80</sup> .....	June 1938.....	May 1941.
S-302-47-1.....	Survey of Lorain Harbor, Ohio. <sup>81</sup> Local interests request modification of the existing project to provide for the extension of the east breakwater and the construction of a shore arm. They also request the construction of a bulkhead to connect the inner end of the east river pier with the shore to replace the deteriorated city bulkhead. The Baltimore and Ohio Railroad requests dredging in the Black River above its coal loading dock to provide sufficient width for the turning of vessels. The improvement recommended consists of the widening of the Black River.	\$30,000.....	December 1939....	January 1941.
S-302-47-2.....	Survey of Black River, Sanilac and St. Clair Counties, Mich., to determine the advisability of modifying the existing project in any way at this time. Involved are topographic and hydrographic surveys, and preparation of plans and estimates at Port Huron, Mich. The investigation and report may result in improvement of the existing project channel and construction of a turning basin near the upper limit of the existing project.	To be determined by survey.	December 1940....	Under way.
S-302-47-5.....	Survey of Ashtabula Harbor, Ohio, <sup>82</sup> relative to extending the channel, 16 feet deep and 100 feet wide, upstream in the Ashtabula River a distance of 2,550 feet, for the benefit of deep draft vessels, effecting a savings in transportation cost, to provide increased winter berthing space, and to eliminate the hazards from ice jams on the lower river. The improvement recommended by the War Department consists of extension of the channel 1,550 feet upstream.	\$38,000.....	March 1939.....	May 1941.
S-302-47-6.....	Survey of Cleveland Harbor, Ohio, to determine the advisability of altering or replacing the bridges across the Cuyahoga River for navigation purposes.	To be determined by survey.	September 1940....	Under way.
S-302-47-8.....	Survey of Huron Harbor, Ohio, to determine the advisability of providing structures to prevent shore erosion along the west sides of the inner harbor, including the benefits that might accrue to navigation interests or to property owners. Involved is the preparation of a plan of improvement and the determination of the most economical type of construction.	do.....	October 1938.....	Do.

<sup>79</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 218, 77th Cong.<sup>80</sup> First stage, \$3,500,000; second stage, \$6,500,000.<sup>81</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 161, 77th Cong.<sup>82</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 321, 77th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-47-9.....	Survey of Fairport Harbor, Ohio, to determine the advisability of extending the west breakwater 500 feet lakeward. The investigation and report may result in the construction of the breakwater to provide greater safety for vessels entering and leaving the harbor.	To be determined by survey.	June 1940.....	Under way.
S-302-47-10.....	Survey of Buffalo Harbor, N. Y., to determine the advisability of further harbor improvements in Buffalo inner harbor and channels leading thereto. The investigation and report may result in deepening the inner channels and the channels leading to the harbor.	.....do.....	June 1939.....	Do.
S-302-47-11.....	Survey of Erie Harbor, Pa. Local interests propose to construct a large pier and coal loading dock at the westerly terminal opposite the foot of Plum St. in Erie. In connection therewith, a channel 25 feet deep from the easterly part of Erie Harbor to the proposed dock, with a turning basin, is to be requested. The report is to cover the cost and justification for this work.	.....do.....	November 1941.....	Do.
S-302-47-12.....	Survey of Great Lakes Connecting Channels—Southeast Bend, St. Clair River, connecting Lake Huron and Lake Erie, <sup>43</sup> relative to providing a cut-off channel 300 feet wide, 25 feet deep, and about 3½ miles long across Harsens Island on the American side of the St. Clair River, to provide a separate downbound channel past Southeast Bend, or widening of the present channel in the Southeast Bend to 700 feet. The Advisory Commission to the Council of National Defense urged immediate construction of the cut-off channel in view of the need in the present emergency for uninterrupted transportation of iron ore from the Lake Superior ranges to the lower lakes. The project recommended by the War Department consists of a cut-off channel about 3½ miles long and 25 feet deep, with a width of 300 feet through a right-of-way 1,000 feet wide across Harsens Island.	\$2,500,000.....	February 1941.....	May 1941
S-302-47-13.....	Survey of Cayuga, Buffalo, and Cazenovia Creeks, N. Y. Local interests suggest a comprehensive program of improvements, including reservoirs, channel rectification, levees, erosion control, reforestation, and education in land use. The improvements recommended by the War Department consist of construction of dikes and walls and improvement of the channel of Cayuga Creek for flood protection at Lancaster. <sup>44</sup>	\$575,000.....	March 1938.....	June 1941.
S-302-47-15.....	Survey of Detroit River, Mich., to determine the advisability of modifying the existing project. Involved are topographic and hydrographic surveys of the river, and preparation of plans and estimates. The investigation and report may result in the construction of a channel in the Detroit River to provide navigable depths from the lower end of the Trenton Channel west of Grosse Isle to deep water in Lake Erie; also the construction of a channel 8 feet deep east of Grosse Isle and west of Stony Island, from the vicinity of the upper end of Grosse Isle to an outlet in Lake Erie.	To be determined by survey.	July 1941.....	Under way.
S-302-47-16.....	Survey of Cleveland Harbor, Ohio, consisting of a study to determine the advisability of extending the channel in the Cuyahoga River upstream to the Harvard-Denison viaduct, a distance of approximately 1.5 miles. Involved are analyses to determine benefits that might accrue as a result of the improvement considered, and a cost allocation between Federal and non-Federal interests. The investigation and report may result in channel improvements in, and the altering or replacing of bridges across, the Cuyahoga River upstream from the existing Federal project limit.	.....do.....	.....do.....	Do.
S-302-48-3.....	Survey of that part of the Great Lakes-Hudson River Waterway lying between Three Rivers Point and Tonawanda, N. Y., otherwise known as the "Western Section of New York State Barge Canal," to determine the advisability of improving the Barge Canal between Three Rivers Point and the Niagara River with Federal funds. The investigation and report may result in the deepening and widening of the canal prism and raising of bridges along the Barge Canal between Three Rivers Point and the Niagara River.	.....do.....	July 1938.....	Do.
S-302-48-4.....	Survey of Great Lakes to Hudson River Waterway connecting Hudson River at Watford, N. Y., with Lake Ontario at Oswego, N. Y., for navigation. The survey and report may result in lowering of lock sills; construction of new guard gates; reconstruction of bridges; construction of additional control features to maintain navigable water levels in the canal; revision of the system of Federal inspection of canal improvements; clarification of the extent to which Federal funds are to be made available for bank protection; and possible elimination of the provision that no more than \$3,285,000 shall be expended on bridges and other overhead structures.	.....do.....	July 1941.....	Do.
S-302-48-7.....	Survey of Moose and Black Rivers, N. Y. Local interests desire that gates be installed at a dam at Carthage to reduce flood stages above; that the channel of Black River be improved by dredging and that ditches to drain bottom lands be improved. The Black River Regulating District, a State agency, desires construction of the Panther Mountain Reservoir on Moose River in the combined interest of flood control and stream regulation. The project recommended by the War Department consists of construction of the Panther Mountain Reservoir, to be operated in the combined interest of flood control and stream regulation.	\$3,800,000 <sup>45</sup> .....	July 1937.....	August 1941.
S-302-48-12.....	Survey of Chittenango Creek and its tributaries, N. Y., for flood control. The investigation and report may result in recommendations for channel improvements for protection from flood damages in the lower valley.	To be determined by survey.	July 1939.....	Under way.
S-302-49-1.....	Survey of Ogdensburg Harbor, N. Y., to determine the advisability of further improving the harbor for navigation by widening the upper entrance channel.	.....do.....	June 1939.....	Do.

<sup>43</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 309, 77th Cong.<sup>44</sup> Project authorized by the Flood Control Act of Aug. 18, 1941, Public Law 228, 77th Cong., on the basis of H. Doc. 326, 77th Cong.<sup>45</sup> Includes local contribution of land and cash, totaling \$3,200,000.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-50-1.....	Survey of Burlington Harbor, Vt., to determine the necessity and justification for construction of a marina. Involved are the preparation of a detailed hydrographic map and engineering studies to determine an adequate plan of improvement.	To be determined by survey.	June 1940.....	Under way.
S-302-51-1.....	Survey of Missouri River Diversion Project, North Dakota and South Dakota, involving a review of the report on the Missouri River, <sup>46</sup> to determine if any modifications should be made at this time in the recommendation for the Missouri River Diversion Project. Involved are topographic and hydrographic surveys, soil and foundation investigations, hydrological and hydraulic studies, power market survey, and preparation of plans and estimates, in cooperation with the Bureau of Reclamation and the Federal Power Commission. The area involved includes the Souris River, Sheyenne River, and Red River Basin in North Dakota, and the James River Basin in North Dakota and South Dakota. Construction which may result from the investigation and report includes a dam and reservoir on the Missouri River, a pumping and canal system for diversion of Missouri River water into the James, Sheyenne, and Souris Rivers and into Devils Lake, and dams and reservoirs on the James and Sheyenne Rivers.	.....do.....	August 1936.....	Do.
S-302-54-2.....	Survey of Mississippi River at Minneapolis, Minn., consisting of review of report, <sup>47</sup> covering the extension of the 9-foot canalization project above St. Anthony Falls in Minneapolis. The review is to determine whether it is advisable for the United States to bear the full cost of necessary bridge modifications and adjustments to utility structures, and whether any other modification of the existing project is advisable at this time.	.....do.....	July 1941.....	Do.
S-302-54-4.....	Review of reports on the Mississippi River between the Missouri River and Minneapolis, Minn., consisting of a report on estimated damages that may be caused to farm and pasture lands and buildings in Minnesota, Wisconsin, and Iowa, by seepage and backwater resulting from the creation of Pools 3 to 11, inclusive; also damages to commercial fishing operations in Wisconsin resulting from the opening of the gates of dams 3, 4, 5, and 6. The investigation work is being done on the Mississippi River and the lower reaches of the adjacent tributaries between Hastings, Minn., and Dubuque, Iowa. No additional construction is contemplated in connection with this investigation, since in practically all cases any remedial works would far exceed in cost the benefits obtained therefrom.	.....do.....	May 1939.....	Do.
S-302-55-2.....	Review of report on Minnesota River <sup>48</sup> to determine the advisability of diverting excess flood waters of the Little Minnesota River into Lake Traverse near Browns Valley, Minn., for flood control and water conservation. Involved is a study of the excess waters of the Little Minnesota River available for diversion together with flood control and water conservation benefits derived therefrom; also plans and estimates for possible diversion project.	.....do.....	July 1941.....	Do.
S-302-56-2.....	Survey of Mississippi River at and in the vicinity of Sabula, Iowa, relative to prevention of further erosion of the existing levees, and raising and strengthening levees. The project recommended by the War Department consists of riprapping to prevent erosion.	\$25,000.....	1939.....	May 1941.
S-302-59-1.....	Survey of Galena River (Fever River), Ill. and Wis. Local interests desire protection for Galena against floods. The project recommended by the War Department consists of construction of levees and floodwalls with related works, and enlarging the flood channel capacity through and below the city by removal and modification of bridges and by channel excavation.	\$418,000.....	August 1938.....	June 1941.
S-302-60-6.....	Survey report on flood control of Farm Creek in Tazewell County near and in East Peoria, Ill., including preparation of plans and estimates of cost. The investigation and report may result in the construction of concrete outlet channels and the rebuilding of four bridges to allow flood flows to pass through East Peoria without overflow.	To be determined by survey.	April 1941.....	Under way.
S-302-60-8.....	Survey of Illinois River, Ill., from Grafton, Ill., to Starved Rock Lock and Dam near Utica, Ill., for flood control. The survey involves the determination of the desirability of conversion of certain drainage and levee districts for use as part of the flood channel of the Illinois River.	.....do.....	1937.....	Do.
S-302-60-9.....	Review of report on the Illinois River, Ill., on flood control in the vicinity of the confluence of the Illinois and Sangamon Rivers; the lower part of the Sangamon River to Chandlerville; and the Hager Slough Special Drainage District, in Cass County near Beardstown. The study involves a topographic and hydrologic survey of the areas adjacent to the streams, together with plans and estimates of cost. The investigation and report may result in the straightening, enlarging, and rectification of the Sangamon River between its mouth and a point about five miles upstream therefrom; the construction of a levee to protect the Hager Slough Special Drainage District; and rebuilding the levees of the Clear Lake Drainage and Levee District.	.....do.....	July 1941 <sup>49</sup> .....	Do.
S-302-60-11.....	Survey of Illinois River, Ill., from the mouth to Starved Rock Lock and Dam, for navigation and flood control. The investigation and report may result in recommendations as to the advisability of reimbursing levee districts along the river for damage by seepage and backwater due to higher pool levels necessitated for navigation.	.....do.....	1937.....	Do.
S-302-65-1.....	Review of reports on Mississippi River between the Ohio River and the mouth of the Missouri River to determine whether any modification in the existing project is advisable at the present time. The current report is to be largely confined to the section between St. Louis and mouth of the Ohio River.	.....do.....	September 1938.....	Do.

<sup>46</sup> H. Doc. 238, 73d Cong.<sup>47</sup> Transmitted to Congress on Mar. 5, 1938.<sup>48</sup> H. Doc. 230, 74th Cong.<sup>49</sup> Survey of Hager Slough Special Drainage District begun in December 1937.



TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-68-1.....	Survey of Bowman Project, North Fork of the Grand River, North and South Dakota, involving a review of the report on the Cannonball, Grand and Moreau Rivers, North Dakota and South Dakota, <sup>10</sup> to determine whether any modification should be made therein at this time in the recommendations for the Bowman irrigation project. Involved are studies of general economic conditions, review and extension of water supply studies, topographic surveys, and subsurface explorations to be coordinated with current investigations being made by the Bureau of Reclamation. Recommendations for construction which may result from the investigation and report consist of an earth-fill dam to create a 19,500 acre-foot storage reservoir on the North Fork of the Grand River above Haley, N. Dak., and necessary distributing canals and laterals.	To be determined by survey.	March 1940 .....	Under way.
S-302-68-2.....	Survey of Heart River, N. Dak., involving a review of the report on the Missouri River, <sup>11</sup> to determine whether any modification should be made therein at this time in the recommendations for the Heart River. Included in this survey report is an independently authorized review report on Missouri River flood control at Mandan. Involved are flood-damage investigations, channel-section and levee surveys, and review and extension of water supply studies, to be coordinated with current investigations being made by the Bureau of Reclamation. Construction which may result from the investigation and report consists of an earth-fill dam to create a 53,900 acre-foot storage reservoir, 2 diversion dams, necessary canals and laterals, and levees for flood protection at Mandan.	.....do.....	.....do.....	Do.
S-302-70-1.....	Survey of Missouri River in South Dakota. Included with this report are the following separately authorized reports: Missouri River, Sioux City, Iowa, to Chamberlain, S. Dak.; Missouri River, Knox and Dixon Counties, Nebr.; and Missouri River, Sioux City, Iowa, to above Niobrara, Nebr. The investigation involves a review of the report on the Missouri River, <sup>12</sup> to determine the advisability of improving the Missouri River in South Dakota to make power available to develop deposits of manganese and other strategic minerals and for pumping and other uses; to determine whether improvement of the Missouri River from Sioux City, Iowa, to Chamberlain, S. Dak., in the interest of navigation and allied purposes is advisable at this time; to determine whether improvement of the Missouri River for flood protection and bank erosion prevention in Knox and Dixon Counties, Nebr., is advisable at this time; and to determine what improvement of the Missouri River is advisable at this time for flood protection and bank erosion protection from Sioux City, Iowa, to the point above Niobrara, Nebr., where the course of the Missouri River is wholly within South Dakota. Involved are flood damage and erosion investigations, topographic and hydrographic surveys, a survey of potential commerce, a power market survey, soil and foundation investigations, hydrological and hydraulic studies, and preparation of plans and estimates, in cooperation with the Bureau of Reclamation, the Bureau of Mines, and the Federal Power Commission.	.....do.....	May 1939 .....	Do.
S-302-70-2.....	Survey of Missouri River at or near Gavins Point, Yankton, S. Dak., involving a review of the report on Missouri River, to determine the advisability of constructing a lock and dam at or near Gavins Point, S. Dak., for navigation, hydroelectric power, flood control, water conservation, and other purposes. A 2-dam project for the accomplishment of above purposes will also be considered. Involved are reconnaissance and soil surveys, flood damage and erosion investigations, a power market study in cooperation with the Federal Power Commission, an investigation into the existing water shortage and potential irrigation development, and topographic, subsurface, and geologic examinations at the dam sites.	.....do.....	April 1938.....	Do.
S-302-71-2.....	Survey of Big Sioux River, S. Dak., at and near its mouth to determine if improvement as a harbor is justified at the present time. Involved are a survey of potential commerce and preparation of plans and estimates from existing topographic maps. Improvements which may result from the investigation and report include construction of approximately 3,350 feet of new Big Sioux River Channel, improvement of approximately 6,100 feet of existing Big Sioux River Channel, construction of approximately 8,100 feet of earth levee, and some Missouri River stabilization work near the mouth of the Big Sioux River.	.....do.....	December 1940.....	Do.
S-302-72-3.....	Survey of South Platte River and its tributaries, Colorado, Wyoming, and Nebraska, to determine a technically sound project for the control of floods. Involved are reconnaissance, topographic, and flood damage surveys, subsurface explorations, slit investigations, economic, hydrological, and hydraulic studies, and design and preparation of cost estimates for dams, reservoir, channel improvements, and levees.	.....do.....	September 1941.....	Do.
S-302-72-4.....	Survey of Bear Creek, Colo., for flood control. The investigation and report may result in recommendations for flood protection at Morrison.	.....do.....	January 1939.....	Do.
S-302-77-4.....	Survey of Kansas Citys of Missouri and Kansas, and adjacent areas on the Missouri and Kansas Rivers and tributaries entering the Missouri River between approximate Missouri River mile 386 and approximate Missouri River mile 356, 1932 mileage. The survey is for flood control in the Kansas Citys area and involves subsurface explorations, topographical surveys, hydraulic and hydrologic studies, flood damage studies of feasibility and cost of protection works. The investigation may result in the recommendation for additional flood protection works in the Kansas Citys area.	.....do.....	1939.....	Do.

<sup>10</sup> H. Doc. 76, 73d Cong.<sup>11</sup> H. Doc. 238, 73d Cong.<sup>12</sup> H. Doc. 238, 73d Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-78-2.....	Survey of Arkansas River and tributaries, Arkansas and Oklahoma, for navigation and power. Involved are detailed topographic and hydrographic maps of the Arkansas River from its mouth to the vicinity of Tulsa, Okla., of the Verdigris River from its mouth to Catoosa, Okla., and of portions of the tributaries within the backwater limits of these streams. The survey also involves investigations to determine economic conditions within the tributary area, thorough analysis of prospective commerce, power markets, and of other benefits that may be derived from the improvements considered, and engineering studies to determine a plan of improvement to provide a channel for modern barge navigation from the mouth of the Arkansas River to the vicinity of Tulsa, Okla., and for possible development of hydroelectric power.	To be determined by survey.	January 1940.....	Under way.
S-302-82-1.....	Survey of pool formed by lock and dam No. 1, White River near Batesville, Ark., for navigation. Involved are a topographic survey and engineering studies to select a site and determine a plan of improvement to provide an adequate harbor for small craft in the vicinity. It is possible that the dredging of a small harbor on White River in the pool near Batesville, Ark., for use by small recreational craft, may result from the report.	.....do.....	July 1940.....	Do.
S-302-82-2.....	Survey of Norfolk Dam on the North Fork River in White River Basin, Arkansas and Missouri, <sup>94</sup> to determine whether provisions should be made for the generation of hydroelectric power at this time in the Norfolk Dam. The improvements recommended by the War Department consist of provision of facilities for the generation of hydroelectric power at Norfolk Dam, now under construction for flood control. Cost of construction of power facilities..... \$12,950,000 Cost of acquisition of 8,700 acres of land required in addition to that required under previous project for flood control alone..... \$550,000	\$13,500,000.....	September 1940.....	May 1941.
S-302-84-1.....	Survey of Arkansas River, Crawford County Levee District, Ark. <sup>95</sup> Local interests desire that the existing Crawford County levees, constructed by the Crawford County Levee District, be strengthened and raised to provide protection from floods equal in magnitude to the 1927 flood, to prevent the large annual flood losses and to increase land values.	\$301,000 <sup>96</sup> .....	1937.....	December 1940.
S-302-84-2.....	Survey of Arkansas River, Ark., on the south bank of the river, from Little Rock downstream to Pine Bluff, Ark. <sup>96</sup> Local interests desire flood protection by raising, strengthening, and connecting the present disconnected and inadequate levees constructed by local levee districts. The improvements recommended by the War Department consist of raising, strengthening, and extending the levees in the Head of Fourche Island to Pennington Bayou Area, and in the Tucker Lake Area.	\$1,324,000.....	March 1937.....	Do.
S-302-84-3.....	Survey of Fourche Bayou, Ark., for flood control in the vicinity of Little Rock, Ark. The investigation may result in a recommendation for a construction project which will include a levee for the protection of Little Rock Municipal Airport (Adams Field), and a pumping plant to insure drainage of the field during flood periods.	To be determined by survey.	February 1941.....	Under way.
S-302-84-4.....	Survey of Arkansas River at Tulsa, Okla. <sup>97</sup> Local interests desire that the disconnected levee system constructed by the Federal Government with relief funds be completed. In their present condition the levees provide very little protection. The improvement recommended by the War Department consists of the enlarging and completion of the levee system to prevent flood damage in the Sand Springs and Tulsa areas on the north bank and in the West Tulsa area on the south bank.	\$605,000 <sup>98</sup> .....	January 1938.....	January 1941.
S-302-84-7.....	Survey of Six-Mile Creek, Logan County, Ark., for flood control, involving protection of McLean Bottom. The investigation and report may result in a recommendation for diversion of Six-Mile Creek west of McLean Bottom to a point on the Arkansas River upstream from the present outlet, and for levee construction.	To be determined by survey.	1938.....	Under way.
S-302-84-8.....	Survey of Levee Districts Nos. 1 and 8, Conway County, Ark., for improved flood protection in the 2 levee districts. Involved are a thorough study of the feasibility of providing general relief for the area from floods on the Arkansas River, topographic and hydrographic surveys, and an economic survey including an estimate of flood damage. The investigation may result in a recommendation for a construction project involving improvement of the present levees.	.....do.....	September 1941.....	Do
S-302-87-1.....	Survey of Jefferson-Shreveport Waterway and Red River from Jefferson, Tex., to mouth of Red River, including Cypress and Black Cypress Creeks, the channel of Red River, and of possible reservoir sites on Cypress and Black Cypress Creeks, to determine the feasibility and justification of improvement for navigation, flood control, power, and irrigation.	.....do.....	January 1938.....	Do.
S-302-88-2.....	Surveys and review of report on Ouachita River and tributaries, Arkansas and Louisiana, <sup>99</sup> covering the entire basin in Arkansas, Louisiana, and specifically the city of Jonesville, La. Included are survey reports on Saline River, Ark.; Boeuf River, La.; Bayou Macon, La.; Bayou Bartholomew, Ark.; and Black River in Louisiana; and abbreviated reports on the Little Missouri River, Ark.; Ouachita River near Calion, Ark., and the proposed Blakely Mountain Dam and Reservoir. The investigation will result in recommendations relative to the advisability of development for navigation, flood control, water power, irrigation, and related subjects on the rivers mentioned.	.....do.....	July 1938.....	Do.

<sup>93</sup> Project authorized by the Flood Control Act of June 22, 1936, Public Law 738, 74th Cong.; the Flood Control Act of June 28, 1938, Public Law 761, 75th Cong., on the basis of Flood Control Committee Doc. 1, 75th Cong.; Flood Control Act of August 18, 1941, Public Law 228, 77th Cong., on the basis of H. Doc. 917, 76th Cong.

<sup>94</sup> Project authorized by the Flood Control Act of August 18, 1941, Public Law 228, 77th Cong., on the basis of H. Doc. 720, 76th Cong.

<sup>95</sup> Includes cost of land and rights-of-way to be furnished by local interests, at an estimated cost of \$17,000.

<sup>96</sup> Project authorized by the Flood Control Act of August 18, 1941, Public Law 228, 77th Cong., on the basis of H. Doc. 718, 76th Cong.

<sup>97</sup> Project authorized by the Flood Control Act of August 18, 1941, Public Law 228, 77th Cong., on the basis of H. Doc. 157, 77th Cong.

<sup>98</sup> Includes estimated cost to local interests at Tulsa and West Tulsa of \$88,000 and \$4,000, respectively.

<sup>99</sup> Report under review, H. Doc. 196, 73d Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-88-7.....	Survey of Ouachita River and tributaries, Arkansas and Louisiana, consisting of a survey of the Blakely Mountain Reservoir, together with engineering and economic studies for determining the economic height of reservoir as a Federal project for the best development of flood control and other purposes, such as water power and navigation. The area to be covered consists of the Ouachita River Valley in Arkansas, the Blakely Mountain Reservoir area in Garland and Montgomery Counties, and the existing Carpenter Dam and Remmel Dam water power plants in Arkansas. The purpose of the survey is to review previous reports <sup>1</sup> to determine the advisability of undertaking the construction of the Blakely Mountain Dam as a Federal flood control project.	To be determined by survey.	August 1941.....	Under way.
S-302-90-2.....	Review of reports on Mississippi River, in its Alluvial Valley from Cape Girardeau, Mo., to the Head of Passes, La. Recommendations of the Mississippi River Commission consist of extension of the main river levees to protect the Yazoo River backwater area and the Tensas-Coeudrie area of the Red River backwater to such grades as in the opinion of the Chief of Engineers will not jeopardize the integrity and safety of the main Mississippi River levees. It is also recommended that rights of way and flowage easements required for future set-back levees be procured at Federal expense.	No increase in authorizations required.	March 1940.....	April 1941.
S-302-90-5.....	Survey of Bayous Petit Anse, Carlin and Tigre, Iberia and Vermilion Parishes, La., including review of previous reports to determine the advisability of further improving these streams at this time in the interests of navigation, and involving field surveys and analyses of commercial statistics and local conditions. The survey may result in dredging operations to enlarge and straighten existing channels.	To be determined by survey.	June 1938.....	Under way.
S-302-90-7.....	Survey of Bayou Grand Caillou and Bayou Le Carpe, La., including review of previous report <sup>1</sup> to determine the advisability of extending the existing project from the Intracoastal waterway to Barrow Street in Houma, La. Involved are field surveys, analysis of commercial statistics, and investigation of local conditions.	.....do.....	July 1938.....	Do.
S-302-90-8.....	Review of reports on Houma-Terrebonne Ship Channel, La., to determine if improvement of this canal in the interest of navigation is advisable at this time.	.....do.....	.....do.....	Do.
S-302-90-9.....	Survey of St. Francis River below Oak Donnick, Ark., consisting of a review of the existing project for flood control, to determine whether any modifications are desirable. The improvements recommended by the War Department consist of modification of the existing project to provide for the construction of a large ditch in Cross County, Ark., in place of a wide leveed floodway as originally planned for flood control in this area, the ditch to begin in the outlet end of the existing project floodway and terminate in St. Francis Bay about 2 miles north of Riverfront.	\$989,500 <sup>2</sup> .....	April 1940.....	April 1941.
S-302-90-10.....	Survey of Bayou Teche, Teche-Vermilion Waterway, and Vermilion River, La. <sup>4</sup> Local interests desire consideration of plans for the benefit of navigation, flood control, and irrigation. The improvements recommended by the War Department consist of modification of the existing project to provide a navigable channel 8 feet deep and 80 feet wide from Vermilion Bay to the Intracoastal Waterway, thence 9 feet deep and 100 feet wide upstream to Lafayette, a nonnavigable channel for flood control on upper Vermilion River to Bayous Borbeau and Fusilier, and for enlarged channels in upper Bayou Teche and Ruth Canal, with a higher pool above Keystone Dam to increase flood channel capacities and improve distribution of flows for irrigation waters.	\$1,390,000.....	May 1939.....	June 1941.
S-302-90-11.....	Survey of Little Caillou Bayou, in Terrebonne Parish, La., for navigation of Little Caillou Bayou, involving a detailed hydrographic survey of the bayou, investigation of economic conditions within the tributary area, and a thorough analysis of existing and prospective commerce and of other benefits that may be derived from the improvements considered. The investigation and report may result in dredging operations to enlarge the existing channel.	To be determined by survey.	July 1941.....	Under way.
S-302-90-12.....	Study of salt water intrusion in the Mississippi River at and below New Orleans, La., to determine the advisability of recommending the institution of measures to increase the salinity of the water during periods of low-water flow. Involved are field observations to determine the type, intensity, and limits of intrusion of salt water from the Gulf of Mexico into the lower Mississippi River, analytical evaluation of various factors relating to saline intrusion, and study in models at the U. S. Waterways Experiment Station for the purposes of observing the mechanics of the salt water wedge type of intrusion, and of determining the relative efficiencies of various expedients designed to limit or prevent such intrusion. This investigation and report will result in recommendations regarding the advisability of instituting measures to decrease or limit salinity intrusion into the lower Mississippi at and below New Orleans, and other methods of safeguarding the water supply at New Orleans and vicinity from objectionable saline content.	.....do.....	June 1940.....	Do.
S-302-91-1.....	Survey of Yazoo River, Miss., including a survey of the Yazoo River Channel, together with engineering and economic studies for canalization, channel dredging and river flow regulation; the area to be covered consisting of the Yazoo-Tallahatchie-Coldwater River main stem, three major tributaries (Steele Bayou, Big Sunflower River, and Yalobusha River), and possible reservoir sites on the Yalobusha and Yocoma Rivers. Also included is a review of reports on the Yazoo River, Miss., to determine whether any modifications of the recommendations therein are desirable at the present time with respect to navigation.	.....do.....	August 1940.....	Do.

<sup>1</sup> H. Doc. 196, 73d Cong., H. Doc. 69, 76th Cong.<sup>2</sup> H. Doc. 206, 72d Cong.<sup>3</sup> No additional authorization required.<sup>4</sup> Project authorized by the Flood Control Act of Aug. 18, 1941, Public Law, 228, 77th Cong., on the basis of S. Doc. 93, 77th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-92-3.....	Survey of LaLoutre, St. Malo, and Yscloskey Bayous, La. <sup>6</sup> Local interests desire a channel 6 feet deep and at least 50 feet wide in Bayou LaLoutre between Hopedale and Bayou St. Malo to provide a less circuitous route and a safe passage during storms for the fishing fleet, and to facilitate recreational navigation in the area. The recommendations of the War Department consists of modification of the existing project to provide a channel 5 feet deep and 30 feet wide.	\$35,000.....	April 1940.....	June 1941.
S-302-03-1.....	Survey of Leaf and Bowle Rivers and their tributaries, Mississippi, for flood control. Involved is a study of flood damages, and the hydraulics of the streams, including precipitation, stream flow, and the routing of floods. The investigation may result in a levee around the town of Hattiesburg and small retarding basins in the headwaters of the streams.	To be determined by survey.	December 1940.....	Under way.
S-302-93-2.....	Survey for flood control of Pearl River, Miss., which may result in construction of levees for protection of certain sections of the city of Jackson, Miss.	.....do.....	January 1938.....	Do.
S-302-93-3.....	Review of report on Mississippi Sound in the vicinity of Pass Christian, Miss., involving an enclosed anchorage basin and short approach channel in front of the town. The survey includes an estimate of yardage, and design and estimate of cost of extensions and repairs to the enclosing breakwaters. The report may result in the dredging of the anchorage basin and approach channel thereto so as to provide a depth of 7 feet at mean low water, and extension and repairs to the existing breakwater.	.....do.....	October 1940.....	Do.
S-302-93-4.....	Survey of Oulport Harbor, Miss., to determine the advisability of providing further improvements including the following proposals: (1) increasing the channel depth of the existing project from 26 to 30 feet; (2) reconstructing and lengthening the breakwater which protects the anchorage basin on the south; and (3) the Federal Government's taking over and maintaining the city small-craft harbor which adjoins the main ship anchorage on the east. Involved are a traffic study to determine the prospective commerce and savings likely to be derived from the proposed improvements, and engineering studies of the proposed breakwater to determine its proper placement, type and cost.	.....do.....	May 1940.....	Do.
S-302-94-1.....	Survey of Sabine-Neches Waterway, Tex., at Port Arthur, <sup>7</sup> involving the widening of the Port Arthur West Turning Basin to 600 feet for a distance of 900 feet from the east end, suitably flared at the entrance, thence tapering a distance of 800 feet to 325 feet at the west end, at a depth of 34 feet, to provide additional turning space and to provide for the safety of vessels at anchor.	\$18,000.....	January 1940.....	May 1941.
S-302-94-2.....	Survey of Sabine-Neches Waterway, Tex., at Orange, involving modification of the existing project to provide at Orange for (a) abandonment of the Orange turning basin, (b) dredging of a channel 25 feet deep and 150 feet wide, suitably widened on banks, through the turning basin area and continuing upstream to the highway bridge, a distance of about 8,230 feet above the upper limit of the present project, and (c) dredging of a cut-off channel 25 feet deep, 200 feet wide, and approximately 2,400 feet long, to accommodate naval vessels now under contract for construction at Orange.	\$137,000.....	February 1940.....	February 1941.
S-302-94-3.....	Survey of Sabine-Neches Waterway, Tex. Local interests desire that the turning basin at Beaumont be extended 600 feet upstream to afford more adequate access to Warehouse No. 7, and desire provision of a channel 30 feet deep and 200 feet wide from the turning basin to the vicinity of the Pennsylvania shipyards and a cut-off across the bend in the river a short distance above. The improved channel is desired to facilitate the launching and repair of large ships, and for the benefit of other industries, the cut-off channel to benefit materially existing traffic, and to provide a berthing and turning area for vessels using the shipyards. The project recommended by the War Department consists of modification of the existing project to provide for a channel 30 feet deep and 200 feet wide from the turning basin to the vicinity of the Pennsylvania shipyards.	\$27,000.....	February 1941.....	July 1941.
S-302-94-5.....	Survey of Mermentau River, La. <sup>7</sup> Local interests generally desire improvements for the benefit of navigation and national defense, flood control and irrigation, and construction of works to prevent salt water intrusion into the rice fields. The improvement recommended by the War Department consists of the flood control features of the "coordinated lesser plan." The Department also determined that the improvements of the Louisiana and Texas Intracoastal Waterway <sup>8</sup> will not result in any increase in salinity.	\$970,000.....	August 1939.....	June 1941.
S-302-94-6.....	Survey of Calcasieu River, La. Local interests desire provision of a channel 32 feet deep and 250 feet wide in the loop around Clooney Island, and upstream to Moss Bluff, Mile 50; and alteration of two main line railroad bridges immediately above Lake Charles to afford an adequate channel for large fully loaded ships, and access to upstream areas suitable for industrial sites with direct railroad connections. The improvements recommended by the War Department consist of modification of the existing project to provide for a channel 30 feet deep and 250 feet wide around Clooney Island.	\$55,000.....	December 1940.....	August 1941.

<sup>6</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of S. Doc. 116, 77th Cong.<sup>7</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of S. Doc. 60, 77th Cong.<sup>8</sup> Project authorized by the Flood Control Act of August 18, 1941, Public Law 228, on the basis of S. Doc. 94, 77th Cong.<sup>9</sup> H. D. 230, 76th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-95-1.....	Survey of Clear Creek and Clear Lake, Tex. <sup>9</sup> Local interests request modification of the existing project to provide a channel 9 feet deep and 75 feet wide to League City, and that the channel into the bay be relocated to give a straight route into the creek to provide a shorter and safer route and a much needed harbor or refuge. The improvements recommended by the War Department consist of the modification of the existing project to provide a channel 7 feet deep and 75 feet wide from deep water in Galveston Bay to a new entrance in Clear Creek, and a channel 7 feet deep and 60 feet wide in Clear Creek and Clear Lake to the county highway bridge at League City.	\$30,000.....	January 1940.....	August 1941.
S-302-95-3.....	Survey of Houston Ship Channel, Tex., consisting of a review of reports on the channel to determine the advisability of modifying the existing project in any way, and particularly with a view to widening and straightening the channel wherever advisable. Involved are a field investigation, an economic study of the traffic on the waterway to determine the benefits that would accrue to improvement of the channel, design and estimate of cost of plans of improvement, and preparation of the report.	To be determined by survey.	August 1941.....	Under way.
S-302-95-5.....	Survey of Trinity River, Tex. <sup>10</sup> Local interests desire improvements in the interest of navigation, flood control, and water conservation. The improvements recommended by the War Department consist of a general plan of development of the Trinity River for flood control and allied purposes and for navigation. Included are the construction of reservoirs at the Benbrook, Little Elm, and Grapevine sites; modification of Garza Dam, and improvement of the levees and floodways at Fort Worth and Dallas for flood protection and water conservation; and provision of a navigable channel from the Houston Ship Channel to Liberty.	\$15,000,000.....	1932.....	September 1941.
S-302-98-1.....	Survey of watershed of Guadalupe River and tributaries, Texas, including a review of a survey report to determine if improvement in the interest of navigation, flood control, water power, or irrigation is advisable at this time, and particularly with a view to constructing dams on the upper section of the river and the tributaries. Involved are field surveys of the channel and flood plain of the river and major tributaries; surveys of lock and dam sites, and dam and reservoir sites; foundation explorations at lock and dam sites; economic survey of flood plain and determination of flood damages; analysis of traffic in the tributary area to determine the prospective commerce on a navigable channel in the Guadalupe River and the savings that would result from movement of the commodities by water; detailed hydrologic and hydraulic studies of storms and floods; studies of plans of improvement; design and cost estimates of improvements; and determination of benefits of improvements. The report may result in a construction project for a navigation channel from Victoria to Seguin and for five dams and reservoirs for flood control and allied purposes on tributaries of the river.	To be determined by survey.	May 1938.....	Under way.
S-302-98-5.....	Survey of Lavaca and Navidad Rivers, Tex. <sup>11</sup> Local interests desire extension of the 9-foot Port Lavaca channel to Texana on Mile 6 of Navidad River, a total distance of 23 miles, in the interest of navigation, and generally suggest control of floods by construction of reservoirs and clearing and improvement of channels throughout the basin. The project recommended by the War Department consists of channel clearing, straightening and enlargement for flood control upstream on the Lavaca and Navidad Rivers and tributaries, relocation of the Southern Pacific bridge at Hallettsville, and improvement of the Lavaca River at that vicinity.	\$348,000.....	May 1938.....	October 1941.
S-302-99-1.....	Survey of Louisiana-Texas Intracoastal Waterway, Corpus Christi to the Rio Grande, and Arroyo Colorado, Tex. <sup>12</sup> Local interests request that the Intracoastal Waterway be extended from Corpus Christi south to Brazos Island Harbor and that a connecting channel be provided in Arroyo Colorado to Harlingen or Mercedes. The improvement recommended by the War Department consists of modification of the existing project to provide for a channel 9 feet deep and 100 feet wide from this waterway to the vicinity of Harlingen via Arroyo Colorado, with turning basin 9 feet deep, 400 feet wide, and 500 feet long at the upper end.	\$2,500,000.....	July 1938.....	September 1941.
S-302-99-2.....	Survey of channel from Aransas Pass, Tex., to the Intracoastal Waterway. Local interests request that the turning basin and channel from the town of Aransas Pass to the Aransas Pass Inlet be deepened to 9 feet to provide for the larger fishing boats now in use in Corpus Christi Bay and the Gulf of Mexico, and to facilitate the movement of general commerce of the surrounding area over the Intracoastal Waterway. The improvements recommended by the War Department consist of modification of the existing project to provide a channel 9 feet deep and 100 feet wide, from the Intracoastal Waterway at Port Aransas, extending approximately 6.1 miles, to a turning basin of the same depth and 300 feet wide by 700 feet long at Aransas Pass.	\$18,000.....	November 1940.....	June 1941.

<sup>9</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 319, 77th Cong.<sup>10</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 403, 77th Cong.<sup>11</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993.<sup>12</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 402, 77th Cong.

TABLE II.—*Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued*

Doeket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-100-1.....	Survey of Brazos Island Harbor, Tex., for navigation. <sup>13</sup> The organized navigation districts representing Brownsville and Port Isabel request deepening of the entrance channel through Brazos-Santiago Pass and widening and deepening of the channels leading to the Brownsville and Port Isabel turning basins to permit safer and more economical navigation of the larger vessels, especially tankers. The Brownsville interests also desire enlargement of the turning basin to provide increased frontage for commercial expansion. The Port Isabel interests, in addition, request the improvement and maintenance of the shallow-draft channel that runs along the southeastern margin of the townsite with a connection to the turning basin for use by fishing and recreational craft. The improvements recommended by the War Department consist of modification of the existing project to provide for deepening the channel through Brazos-Santiago Pass to 35 feet from deep water in the Gulf of Mexico to station 0+000; deepening and widening the bay channel to 33 by 200 feet from station 0+000 to station 15+525; deepening the Brownsville channel to 32 feet from station 15+525 to station 82+890; deepening the Port Isabel channel and turning basin to 32 feet; extending the north side of the Brownsville turning basin 5,140 feet to the east and deepening the basin to 32 feet; and dredging the shallow-draft channel from the railroad bridge around the south part of Port Isabel to the shore line to Laguna Madre and the shallow-draft channel connecting with Port Isabel turning basin to provide a depth of 6 feet and a width of 60 feet.	\$635,000.....	November 1939.....	May 1941.
S-302-100-2.....	Review of reports on Brazos Island Harbor, Tex., at and near Port Isabel, to determine if the existing project should be modified to provide for prevention of the movement of sand by wind action into the channel and town of Port Isabel. Involved are a field investigation, studies of sand movement, design and estimate of cost of plans of improvement, and preparation of the report. The report may result in a project for the construction of structures or the planting of vegetation to control the movement of sand by winds.	To be determined by survey.	June 1941.....	Under way.
S-302-102-2.....	Survey of Animas River, Colo. and N. Mex., involving field and office studies to determine the economic feasibility of flood control. Involved are investigations of topography, rainfall, run-off, existing channels, land use and development, past flood damage, and probable future flood damage, and analyses of the cost and effectiveness of various plans for flood control. The investigation may result in a recommendation for construction of a project involving channel improvement and alignment.	.....do.....	July 1941.....	Do.
S-302-103-4.....	Survey of the Virgin River and tributaries in Nevada, Arizona, and Utah, including Short Creek, Ariz., and Utah, and Beaver Dam Wash, Ariz., Utah, and Nev. The investigation involves an instrument survey, foundation investigations and economic studies of reservoirs for flood control and multiple-purpose improvements, including flood control combined with water conservation.	.....do.....	March 1940.....	Do.
S-302-105-2.....	Flood-control investigation of Klamath River and tributaries, Oregon and California, to determine feasibility of providing protection in 3 principal localities in the basin, namely, Scott River, Shasta River, and the reaches of Klamath River near the mouth.	.....do.....	April 1941.....	Do.
S-302-106-1.....	Survey of Pinole Shoal and Mare Island Channel and Turning Basin, Calif., <sup>14</sup> north of San Francisco Bay, involving dredging to a depth of 20 feet over approach areas adjacent to the developed water front at Vallejo and South Vallejo, to provide adequate depth to the water front facilities, and maintenance of the two approach areas to the navy yard piers at the southern end of Mare Island.	\$7,600.....	October 1939.....	May 1941.
S-302-106-2.....	Survey of Sacramento and San Joaquin River Valleys, Calif., with respect to flood control for Butte Creek. Involved are preparation in the field of general data and statistics, hydrologic and hydraulic data, flood damage data, channel surveys, levee surveys, dam site and reservoir surveys, geological examinations and explorations, soil samples, and land appraisals. Office work involved includes general studies, hydrological and hydraulic studies, flood damage analyses, flood damage prevention studies, benefit analyses, economic studies, and preparation of plans, estimates, and report. A project for flood control may be recommended as a result of the survey.	To be determined by survey.	October 1940.....	Under way.
S-302-106-3.....	Survey of Sacramento and San Joaquin River Valleys, Calif., with respect to flood control for Sacramento River and tributaries above Shasta Dam. Involved are field and office work consisting of general studies, hydrologic and hydraulic studies, flood damage surveys and analyses, profile and channel surveys, aerial surveys, dam site and reservoir surveys, water conservation studies, geological examinations and explorations, benefit analyses, economic studies, soil samples, land appraisals, and preparation of plans, estimates, and report. A project for flood control, or flood control in combination with conservation, may be recommended as a result of the survey.	.....do.....	.....do.....	Do.
S-302-106-4.....	Survey of Richmond Harbor, Calif., <sup>15</sup> involving modification of the existing project to provide a channel about 2,000 feet long, 150 feet wide and 20 feet deep, extending easterly on the north side of Point San Pablo, to serve the wharves of the fish reduction plants located along San Pablo Bay shore.	\$25,000.....	August 1939.....	January 1941.
S-302-106-5.....	Survey of Sacramento River and tributaries, Calif., within the existing flood control project. <sup>16</sup> Local interests desire completion of the approved project for the flood control of the Sacramento River and tributaries. The improvements recommended by the War Department consist of the completion of construction of the flood control project.	10,500,000.....	1936.....	March 1941.

<sup>13</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 347, 77th Cong.<sup>14</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 217, 77th Cong.<sup>15</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 715, 76th Cong.<sup>16</sup> Project modified by the Flood Control Act of Aug. 18, 1941, Public Law 228, 77th Cong., on the basis of H. Doc. 205, 77th Cong.



TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-106-10.....	Survey of Redwood Creek, Calif. <sup>17</sup> Local interests desire provision of a channel across San Bruno Shoal suitable for use by deep draft ocean-going vessels and deepening of the present Redwood Creek Channel and Basin to permit the larger deep draft vessels to use the channel in safety. The Navy Department indorsed the project as being essential to the national defense. The project recommended by the War Department as a national defense measure consists of modification of the existing project to provide for a channel 30 feet deep and 500 feet wide across San Bruno Shoal; for a channel 30 feet deep and 300 feet wide, from deep water in San Francisco Bay to the vicinity of the mouth of Westpoint Slough in Redwood Creek; and for a turning basin 30 feet deep and 400 to 900 feet wide and 2,200 feet long at the upper end of this channel.	\$483,000.....	July 1941.....	November 1941.
S-302-106-11.....	Survey of Richmond Harbor, Calif., for navigation. Limited to a portion of the inner harbor, the survey involves a hydrographic survey of a portion of the area east of Brooks Island, and a study of the probable effects of making the inner harbor a closed basin. The purpose is to determine the advisability of constructing a wall between Brooks Island and Point Fleming so as to cut off the tidal currents which now enter the Richmond Harbor Channel through this gap.	To be determined by survey.	October 1941.....	Under way.
S-302-107-1.....	Survey of Monterey Bay (Moss Landing), Calif., for navigation. The survey involves possible construction of an inland harbor with entrance channel protected by jetties, to afford an opportunity for construction of necessary boat repair facilities and fish processing plants and relieve congestion at Monterey.	.....do.....	December 1939.....	Do.
S-302-107-3.....	Survey of Morro Bay, Calif. <sup>18</sup> The improvements recommended by the War Department to provide a harbor of refuge for small craft and to help restore the commercial fishing industry, and as an element of the national defense program, consist of improvement of the existing entrance channel to a depth of 16 feet, 350 feet wide, the entrance to be protected by a stone breakwater 1,000 feet long, with a basin of the same depth easterly of Morro Rock; the repair of the stone dike on the west side of the basin; the dredging to the depth of 16 feet of a triangular area easterly of the northern end of the channel about 2,000 feet long, 1,000 feet wide at the base, tapering to a width of 200 feet; and the improvement of the inner channel to a depth of 12 feet for a length of 5,150 feet, with a turning basin of the same depth 500 feet square at the northerly end.	\$976,000.....	August 1938.....	April 1941.
S-302-108-1.....	Survey of Santa Barbara Harbor, Calif. <sup>19</sup> Local interests desire that the project method of harbor maintenance be changed from biennial dredging by the United States to maintenance and beach restoration by a fixed plant to be constructed and operated by local interests, the Federal Government to contribute the present approved estimated annual cost of maintenance as its share of the cost of operating the plant. The suggested method of maintenance is recommended by the War Department as worthy of undertaking and it is recommended that the United States should participate in the cost to the extent of contributing an amount not in excess of the authorized cost of harbor maintenance by the most economic method.	No additional funds required.	August 1940.....	June 1941.
S-302-108-2.....	Survey of San Diego Harbor, Calif. The Navy Department requested modification of the existing project by the dredging to a depth of 10 feet of an area of 3,000 acres lying near the center of San Diego Bay, and the reclaiming by deposit of dredge material of an area of about 110 acres, for the exclusive needs of naval aviation and as an element in the national defense. The recommendation of the War Department consists of the modification of the existing project in the interest of national defense.	\$3,875,000.....	March 1940.....	January 1941.
S-302-108-3.....	Survey of Los Angeles and Long Beach Harbors, Calif. Local interests desire modification of the existing project by dredging to depths of 36 feet and 40 feet large areas in the outer harbor; dredging the central portion of West Basin to a depth of 35 feet; the construction of a breakwater wing to protect the Los Angeles Harbor entrance from surge and currents; correction of the conditions at Los Angeles River flood control channel where silt deposits obstruct the outlet; and depositing the dredge material at various designated sites. The Navy Department requested the construction of a detached breakwater 7,920 feet long, and the dredging of certain areas to a depth of 40 feet to accommodate capital ships and aircraft carriers of the fleet. The improvements recommended by the War Department consist of the dredging of the areas protected by the existing breakwater, construction of a second detached breakwater, and the dredging for a settling basin at the mouth of the Los Angeles River Diversion Channel to prevent shoaling of the harbor. In response to a request of the Navy Department the plan of proposed improvements was amended to change the proposed breakwater extension at Long Beach from a length of 7,920 feet to 21,000 feet. <sup>20</sup>	\$17,674,000.....	September 1938.....	Do.
S-302-108-4.....	Survey of Ventura River, Ventura County, Calif., relative to channel improvements in Ojai Valley, and construction of reservoirs for flood control and water conservation on Coyote, Matilija, and San Antonio Creeks. The project recommended by the War Department consists of protection of the city of Ventura by a levee on the left bank of the river and construction of a debris basin at the mouth of Stewart Canyon with a concrete channel to carry flood flows through the city of Ojai.	\$1,600,000.....	.....do.....	May 1941.

<sup>17</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993.<sup>18</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 283, 77th Cong.<sup>19</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 348, 77th Cong.<sup>20</sup> Project authorized by the National Defense Rivers and Harbors Act of Oct. 17, 1940, on the basis of H. Doc. 843, 76th Cong., with modifications.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-108-7-----	Survey of San Diego Harbor, Calif. The Navy Department requested in the interest of national defense that triangular-shaped approaches be dredged at the westerly ends of the 26- and 35-foot anchorage areas to permit safer and more complete use of the anchorage areas. The improvement recommended by the War Department consisted of modification of the existing project to provide the proposed approaches. <sup>11</sup>	\$165,000-----	May 1941-----	August 1941.
S-302-108-8-----	Survey of Newport Bay Harbor, Calif., consisting of a review of reports. Involved are investigations to determine economic conditions within the tributary area, a thorough analysis of prospective commerce and other benefits that may be derived from the projects considered, and engineering studies to determine whether the plan of improvement submitted by local interests is justified at this time. The investigation and report may result in the dredging of additional areas in Newport Bay Harbor, for small-boat anchorages and for enlargement and deepening of existing channels.	To be determined by survey.	September 1941---	Under way.
S-302-108-10-----	Survey of Laguna Dominguez, a group of low-lying natural lake beds draining into the east basin of Los Angeles Harbor, Calif., consisting of a review of the report on Los Angeles and San Gabriel Rivers and their tributaries and Ballona Creek, <sup>12</sup> to determine whether flood control works on Laguna Dominguez are advisable in the interest of national defense, and whether modifying the recommended plan for flood control is justified.	---do-----	August 1941-----	Do.
S-302-110-3-----	Survey of main stem of the Snake River, Idaho, Wash., and Ore. Local interests in the Helise-Roberts area desire the construction of a reservoir on the Snake River to serve the combined interests of flood control, water conservation, and power development; and also desire improvement of the channel through the threatened area. Interests at Weiser desire that steps be taken to prevent further bank erosion. It was determined by the War Department that reservation of flood storage capacity in the Grand Valley Reservoir, proposed for construction by the Bureau of Reclamation, would have a value for flood control that would warrant a charge of \$7,431,000 against flood control, and that supplemental channel improvement by the War Department is recommended at critical points between Helise and Roberts, and rip-rapping of river banks to arrest erosion of agricultural lands near Weiser.	\$743,000-----	August 1938-----	August 1941.
S-302-111-1-----	Survey of Columbia River at Kennewick, Wash., <sup>13</sup> relative to extension of the existing project to provide for improvement from the mouth of Snake River to Kennewick, a distance of 4 miles, and dredging of an area between the river channel and a proposed terminal.	\$30,000-----	March 1940-----	May 1941.
S-302-112-1-----	Review of report on Columbia River, Ore. and Wash., to determine the feasibility of providing an adequate channel and turning basin at Underwood, Wash. The survey involves studies of present transportation rates and present and proposed shipments of commodities to and from the area; study of type and cost of water terminals required; field survey to determine channel dredging required to provide access to proposed terminals and estimate of cost of proposed dredging.	To be determined by survey.	July 1939-----	Under way.
S-302-112-2-----	Survey of Birch Creek, Ore. <sup>14</sup> Interests at Pilot Rock desire protection from damaging floods by the enlargement and straightening of the two channels through the town. The project recommended by the War Department consists of clearing and improving the channels.	\$34,000-----	June 1939-----	March 1941.
S-302-112-7-----	Survey of Alkali Canyon, Columbia River Basin, Ore., for flood control. The investigation and report may result in improvement of the channel within the town of Arlington.	To be determined by survey.	November 1939---	Under way.
S-302-113-1A-----	Survey of Cowlitz River, Wash. Local interests desire the dredging of the old mouth of Cowlitz River to provide an entrance from Columbia River for the accommodation of vessels bringing logs to the mills at Longview. The improvement recommended by the War Department consists of providing a channel 8 feet deep at low water and not less than 150 feet wide.	\$12,000-----	1940-----	June 1941.
S-302-113-4-----	Survey of Columbia and Lower Willamette Rivers between Portland, Ore., and the sea, involving investigation of eroding banks along the Washington side of the Columbia River, in Clark County, Wash., from the Vancouver Lake area downstream to the mouth of Lake River, Wash., and a study of the cause thereof, to determine if the erosion which is taking place is the result of improvements in the interest of navigation, and whether remedial works consisting of bank revetments and spur dikes are justified as an improvement in the interest of navigation.	To be determined by survey.	December 1940---	Under way.
S-302-113-7-----	Survey of Columbia River, Port of Longview, Wash. <sup>15</sup> Local interests desire provision of a secondary channel along the Washington side of the river, to provide an alternate route for safe navigation in fog and a more direct connection between terminals. The project recommended by the War Department consists of modification of the existing project to provide for an auxiliary channel from the Longview Port dock downstream along the pierhead line past the Weyerhaeuser Timber Co.'s plant at Longview to a connection with the main ship channel below Mount Coffin.	\$81,000-----	March 1941-----	October 1941.
S-302-114-1-----	Survey of Stillaguamish River, Wash. <sup>16</sup> Local interests request dredging of a channel from Stanwood into Puget Sound so that freight boats which previously served the community can resume operations. The improvement recommended by the War Department consists of a channel 75 feet wide with the bottom at the elevation of mean lower low water.	\$35,000-----	June 1939-----	March 1941.

<sup>11</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 390, 77th Cong.<sup>12</sup> H. Doc. 838, 76th Cong.<sup>13</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 324, 77th Cong.<sup>14</sup> Project authorized by the Flood Control Act of Aug. 18, 1941, Public Law 223, on the basis of H. Doc. 89, 77th Cong.<sup>15</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, based on H. Doc. 341, 77th Cong.<sup>16</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 286, 77th Cong.

TABLE II.—Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-114-2.....	Survey of channel from Puget Sound into Lake Crockett (Keystone Harbor), Wash., <sup>17</sup> relative to dredging a basin in the southwest corner of Lake Crockett to a depth of 18 feet with an entrance channel 150 feet wide from Admiralty Bay, protected by a suitable breakwater, in the interest of navigation and to provide a harbor of refuge. This improvement is desired by the Navy Department in connection with national defense measures. The project recommended by the War Department consists of improvement of Lake Crockett, to provide a basin with an area of about 6 acres and a depth of 18 feet, connected with Admiralty Bay by a channel of the same depth and 150 feet wide.	\$225,000.....	July 1940.....	May 1941.
S-302-114-3.....	Survey of Lake Washington Ship Canal, Wash., in King County, including part of Seattle, Lake Washington, and the Cedar River watershed, to determine advisability of constructing a dam at the outlet of Cedar Lake to provide additional water for operation of Lake Washington Ship Canal during summer months. Investigations also to be made to determine incidental benefits that would accrue to city of Seattle's hydroelectric plant at Cedar Falls, to the Seattle municipal water supply, and to Cedar River Valley by reason of reduction in flood damages as a result of increased controlled storage in Cedar Lake.	To be determined by survey.	June 1940.....	Under way.
S-302-115-1.....	Survey of Port Angeles Harbor, Wash., <sup>18</sup> relative to providing protection to Ediz Hook from erosion and breaching, and removal of a shoal from the south side of the harbor, in the interest of safety to general navigation. The project recommended by the War Department consists of dredging of the shoal between deep water in Port Angeles Harbor and the pierhead line in the vicinity of the Rayonier plant to a depth of 30 feet for a length of 150 feet, more or less.	\$10,000.....	April 1933.....	May 1941.
S-302-116-5.....	Survey of Tillamook Bay, Oreg., with a view to protection of Bay Ocean and property thereon from erosion and storms. Involved are an investigation, analyses of previous surveys and reports, and present surveys of offshore, shore line, entrance and bay changes in the vicinity of Tillamook Bay entrance and along Bay Ocean Spit on the south side of the entrance; and an economic analysis of the justification of proposed improvements. The purpose is to determine if damage along Bay Ocean Spit from erosion and storms can be checked by construction of a jetty on the south side of the entrance, by construction of groins along the sea side of the spit, or by any other feasible means.	To be determined by survey.	September 1933....	Under way.
S-302-116-6.....	Survey of Yaquina Bay and Harbor, Oreg. <sup>19</sup> Local interests request that the jetties be extended to Yaquina Reef; that a depth of 26 feet be provided through the entrance, and that an inner channel not less than 22 feet deep to a turning basin of equal depth in the vicinity of Newport be provided to assure all year round operation from the harbor, enable vessels to load to increased drafts, and lessen loss of time awaiting favorable tides. The project recommended by the War Department consists of modification of the existing project to provide, insofar as the rock bottom will allow, for a channel 26 feet deep and of suitable width across the entrance bar, a channel 20 feet deep and 300 feet wide from the outer end of the jetties upstream, a distance of about 2 miles, and a turning basin 22 feet deep, 1,000 feet wide, and 1,200 feet long.	\$162,000.....	July 1940.....	June 1941.
S-302-116-7.....	Survey of Depoe Bay, Oregon. <sup>20</sup> Local interests desire that the entrance and inner basin be deepened to 8 feet to avoid loss of time by boats awaiting high tides and to permit larger boats to use the bay; that the basin be enlarged to relieve congestion and fire hazards; and that a short breakwater be constructed north of the entrance to intercept swells during high tide and stormy weather. The U. S. Coast Guard has indicated that the bay is of importance as a refuge for small boats. The project recommended by the War Department consists of modification of the existing project to provide for a breakwater north of the entrance, for an entrance channel 8 feet deep and 30 feet wide, and for an inner basin 350 by 750 feet, 8 feet deep, with a retaining wall along the easterly side.	\$214,000.....	do.....	Do.
S-302-116-9.....	Survey of Umpqua River, Oreg., from head of tide at Scottsburg to Roseburg, consisting of a comprehensive study in the interest of navigation to Roseburg, in connection with power development, flood control and irrigation in the upper valley. Studies include dam surveys, preparation of plans and estimates, a study of potential river traffic, including estimates of savings and benefits which might be expected from multiple purpose development of the river.	To be determined by survey.	July 1933.....	Under way.
S-302-116-10....	Review of reports on Umpqua Harbor and River, Oreg. to determine whether modification of the existing project is advisable at this time to provide for improvement of Winchester Bay, Oreg., an arm of the Umpqua River about 2 miles above its mouth.	do.....	May 1941.....	Do.
S-302-116-18....	Survey of Nehalem River, Oreg. Local interests desire improvements to prevent flooding, bank erosion, and channel changes in the lower river reaches. The improvement recommended by the War Department consists of measures to prevent damages from salt water caused by tidal overflow on only one tract of land out of 4 tracts involved.	\$33,000.....	1936.....	November 1941.
S-302-116-21....	Survey of Coquille River, Oreg., for flood control. The investigation and report may result in the construction of levees, bank protection, and closure of washes at the heads of Beaver Slough and Fat Elk Drainage Districts.	To be determined by survey.	July 1937.....	Under way.
S-302-117-2.....	Survey of Gastineau Channel, Alaska, <sup>21</sup> relative to dredging a 75-foot channel through Gastineau Bar in the interest of navigation, and using the dredge spoil to enlarge an existing airfield, to reclaim pasture lands, and for flood protection to the airfield.	\$155,000.....	April 1939.....	May 1941.

<sup>17</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 303, 77th Cong.<sup>18</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 331, 77th Cong.<sup>19</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of S. Doc. 119, 77th Cong.<sup>20</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 350, 77th Cong.<sup>21</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 325, 77th Cong.

TABLE II.—*Surveys under way as of Dec. 1, 1941, and surveys completed with favorable reports since Dec. 1, 1940—Continued*

Docket No.	Name, location, and purpose of survey	Estimated cost of project	Date started	Date completed
<b>WAR DEPARTMENT—Continued</b>				
<b>Corps of Engineers—Continued</b>				
S-302-117-4.....	Review of reports on Skagway Harbor, Alaska, involving the possible improvement of Skagway Harbor for navigation, and consisting of a hydrographic survey of the tidal flats lying between Skagway and its harbor, an investigation to determine if the present and prospective maritime traffic at the locality would be sufficiently benefited by further improvements to justify their cost, and engineering studies to determine the cost and feasibility of a small boat basin and protecting breakwater.	To be determined by survey.	August 1941.....	Under way.
S-302-117-14.....	Survey of Valdez Harbor, Alaska, for navigation. Involved are engineering and economic studies to determine the nature, cost, and feasibility of further improvement of Valdez Harbor. The investigation and report may result in the construction of breakwaters, and additional dredging to enlarge the existing small boat basin.	.....do.....	July 1941.....	Do.
S-302-119-1.....	Survey of Port Allen Harbor, T. H., <sup>32</sup> in Hanapepe Bay, on the Island of Kauai, involving enlargement of the harbor by dredging an area 1,200 feet long, 200 feet wide and 35 feet deep to provide additional maneuvering space for the safety of vessels.	\$75,000.....	May 1939.....	April 1941.
S-302-119-4.....	Survey of Waima, Hanapepe, and Wailua Rivers and tributaries and Kapaa Swamp on Island of Kauai, T. H. Involved are field surveys over the flood plains to determine topography, property damage, and general physical conditions; office studies to determine storm run-off develop, the best plan of protection, and make an economic analysis thereof. The purpose is to determine the advisability of improving stream channels, constructing levees, jetties, or flood walls, or performing other work with a view toward protection against damage by floods.	To be determined by survey.	March 1941.....	Under way.
S-302-119-5.....	Survey of Wailoa River and tributaries, Island of Hawaii, T. H. Involved are field surveys over the flood plains to determine storm run-off, develop the best plan of protection, and make an economic analysis thereof. The purpose is to determine the advisability of channel excavation, construction of flood walls, levees or jetties, or performing other work with a view toward protection against damage by floods.	.....do.....	December 1940....	Do.
S-302-119-6.....	Survey of Keehi Seaplane Harbor, Oahu, T. H. <sup>33</sup> The existing project provides for three runways, "A," "B," and "C." The Navy Department and the Pan-American Airways stated that Runway "C," as provided for, is of inadequate length for safe use by the larger modern planes and would be particularly hazardous for the still larger planes in prospect. The Commanding General, Hawaiian Department, and the Inter-Island Airways, Ltd., consider that the use of this runway would constitute a flying hazard over the John Rodgers Airport. These interested parties all concur in a proposal of the Civil Aeronautics Administration that there be substituted for Runway "C," a parallel Runway "D," 2.25 miles long, 1,000 feet wide, and 10 feet deep, crossing the principal runways near their easterly end and protected by a seaward breakwater. The project recommended by the War Department consists of modification of the existing project as proposed above.	\$742,000.....	May 1941.....	August 1941.
S-302-119-7.....	Survey of Honolulu Harbor, T. H. <sup>34</sup> The Commanding General, Hawaiian Department, requests additional improvement of the reserved channel to facilitate use of the terminals under construction by the United States Army, and that about one million cubic yards of the dredge spoil be used for filling lowlands of Fort Shafter Military Reservation. The project recommended by the War Department consists of modification of the existing project to provide for deepening the full 1,000-foot width of the reserved channel to 35 feet and provision of a turning area 35 feet deep and roughly 2,000 feet wide and 2,200 feet long in Kapalama Basin, and the use of about one million cubic yards of dredge spoil for filling lowlands on the Reservation.	\$1,410,000.....	July 1941.....	November, 1941.
S-302-121-2.....	Survey of Ponce Harbor, P. R., for navigation. Involved is the preparation of a detailed hydrographic map, including subaqueous information, of an area of about 200 acres surrounding the municipal pier and Gata Reef at Ponce Harbor. The survey also involves an investigation to determine economic conditions within the tributary area, analysis of prospective commerce and savings and other benefits that may result from proposed improvements, and engineering studies to determine an adequate plan of improvement. The survey and report may result in dredging of an area adjacent to the municipal pier and construction of a breakwater, extending from Carenero Point, for the protection of the harbor in the vicinity of the municipal pier.	To be determined by survey.	November 1940....	Under way.
S-302-121-3.....	Survey of La Plata River, P. R., with a view to providing flood protection by means of local works at the City of Comerio. Involved is a study of past floods, including flood heights, peak discharges, flood damages, and loss of life, a detailed topographic survey of the flooded area in the vicinity of Comerio as a basis for determining what measures for protection are best suited, and what effect these measures will have in reducing flood damages in the future. A project involving construction of retaining levees, pressure culverts and pumping stations may result from the survey.	.....do.....	March 1941.....	Do.
S-302-124-1.....	Preliminary investigation and survey of the International Rapids Section of the St. Lawrence River, <sup>34</sup> including, among other things, (1) preliminary investigation of potential sites for structures by means of core-borings, test pits, soil analyses, etc., (2) preliminary surveys of the land necessary for such development, and investigation of the titles to such lands, (3) preparation of preliminary plans and specifications.	.....do.....	October 1940.....	Do.

<sup>32</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 180, 77th Cong.<sup>33</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993, on the basis of H. Doc. 379, 77th Cong.<sup>34</sup> Project included in the pending Omnibus Rivers and Harbors Bill, H. R. 5993.

**Table III.—PROJECTS AVAILABLE FOR CONSTRUCTION IN LATER YEARS BY CONSTRUCTION AGENCIES (CLASS I)**

This table summarizes projects available for construction in later years as proposed by the construction agencies (Class I) and reported to the National Resources Planning Board under Executive Order No. 8455. The projects contained in this table comprise one part of the "shelf" or reservoir of projects, which also includes the work on projects now under construction but which will not be completed until after the fiscal year 1943, as detailed in Table I. As the surveys listed in Table II are brought to completion, many of the resultant projects will be included in the reservoir.

The projects for which the proposed expenditures are summarized in this table have been grouped into five purpose classifications: land development and protection, promotion of transportation, power generation and distribution, education, welfare and health facilities, and government administration. Within each of these major purpose classifications the types of work to be undertaken are detailed.

The classification of defense projects is omitted from the table. Ordinarily, the defense classification would include projects of the Navy Bureau of Yards and Docks, the military construction of the Corps of Engineers in the War Department, and certain projects of the Maritime Commission. Because of the many questions of national defense policy involved, such projects are omitted entirely.

Contained within the over-all totals of this table are a large number of projects for which plans are in various stages of preparation. Many of these projects require only standard plans for construction, while others require detailed plans involving considerable time for their preparation. The larger and more important navigation, flood control, irrigation, and power projects generally require a considerable period of time for preparation of plans, while in most cases, small projects for forest, park, and range development utilize standard plans which are already available. Also, some of the programs submitted by the various agencies and included in this table are based on detailed and continuing analyses of projects to determine their priority for construction and their relationship to general plans of improvement. Other groups of projects included in the table will require extensive revisions by the construction agencies in order to fit the projects into a coordinated program of development.

Another important difference between groups of projects included in the table is the variation in the scope of the programs submitted by the various agencies. For instance, the Corps of Engineers does not report projects unless they have been authorized for construction by Congress, although cost estimates

for many additional projects have been determined as the result of surveys. Other agencies have not projected their programs of future construction over many years, or such programs are still in the process of preparation, and are included in Table II as surveys under way. On the other hand, some agencies have developed construction programs and submitted projects covering a long period of years. Thus, Table III must be considered as only a preliminary summary of the "shelf" of projects for future construction, and one that will be increased in total and refined in its content as the process of preparing a public works reservoir for the post-war period continues.

Under the terms of Executive Order No. 8455, the National Resources Planning Board is responsible for correlating the plans for the projects as summarized in Table III, with relevant national, regional, State, or local development plans in order to resolve any conflicts as to timing, priority, or design. Some groups of projects, such as those involving flood control, navigation, and hydroelectric power, have passed through the correlation process. For other groups, such as those involving forest, park, and range land improvements correlation processes are now being evolved.

Although that portion of the reservoir of projects for future construction which is included in Table III must still be considered as incomplete, it is significant that the total volume of projects included in the table has increased considerably during the year 1941. As of December 1, 1940, Table III included a total of \$2,750,000,000 in projects available for construction in later years. As of December 1, 1941, this total was \$3,870,000,000.

The mere existence of a large volume of projects, however, will not insure a practical and workable program of public works for the post-war period. Aside from the many questions involved in the shift in employment from the war effort to the post-defense program, there are certain problems which must be met in the preparation of projects for construction when they are needed. Among the more important of these are:

1. *The continuation and expediting of the survey process.*—As the construction of nondefense projects is deferred because of the war, the attention of the various construction agencies should be turned toward the making of surveys for construction projects to be included in the reservoir.

2. *The completion of the program of correlating project plans.*—In the time lag between the submission of projects for the reservoir and their eventual construction, the correlation process should be carried to completion, and the projects fitted into the various functional,



regional, and agency plans. This would assure the preparation of a coordinated program with all conflicts resolved.

3. *The speeding up of the program of plan preparation.*—Detailed plans could be prepared for those projects which the correlation process has determined to be desirable and for which high priority ratings have been given. The engineering staffs of nondefense agencies could carry on this work in place of their normal construction activities.

In this way a sizable reservoir of worth-while construction projects, correlated with long-term functional, regional, and agency development plans, and with plans and specifications for construction already prepared, would be available for undertaking as soon as needed after the war emergency.

Further details on the various types of construction projects included within the purpose classifications are given in the following discussion.

## **Land Development and Protection**

### **Flood Control**

This classification covers projects estimated to cost \$396,000,000 and includes the program of the Corps of Engineers, and some projects of the Tennessee Valley Authority, the International Boundary Commission, and the Department of Agriculture. As previously indicated, the Corps of Engineers' program includes only those projects which have been previously authorized by the Congress. The majority of the current proposals for flood control are included, however, because the Flood Control Act of August 18, 1941, authorized the construction of a number of proposed projects, most of which have been deferred for future construction. A number of other flood control projects authorized in previous years are currently inactive because local participation or other similar cooperation is lacking.

The projects reported by the Tennessee Valley Authority involve protection of areas along the Tennessee River and tributaries. Projects reported by the International Boundary Commission involve flood protection along the Rio Grande River, while the flood control projects reported by the Department of Agriculture involve a program of water-flow retardation and soil erosion in the interest of flood control.

In general, plans for projects in this classification have been correlated and for many of the projects detailed plans and specifications can be prepared so that the work can be undertaken.

### **Irrigation**

The total of \$220,000,000 included in this classification covers the program of the Bureau of Reclamation, the International Boundary Commission, and the irriga-

tion projects of the Bureau of Indian Affairs. The greatest proportion of work is that under jurisdiction of the Bureau of Reclamation, involving construction of dams and reservoirs, pumping plants, canals, and water distributing systems on irrigation projects throughout the West. These are all "regular" projects of the Bureau of Reclamation as distinguished from Wheeler-Case projects, most of which are still in the survey stage. Plans could be prepared for many projects in this group and thus they would be ready for construction when needed in later years.

The projects of the Bureau of Indian Affairs included in this classification consist of irrigation works on Indian reservations throughout the West. Although this program is not as extensive in scope as the irrigation program of the Bureau of Reclamation, it does constitute an important portion of the program of irrigation projects available for construction in later years. The International Boundary Commission projects involve irrigation of lands along the United States-Mexico border, where the international aspects require the special consideration of this agency.

Although these projects are classed as "irrigation," many of them are multi-purpose, with other features including flood control, recreation, and provision of hydroelectric power. They have been placed in this classification because irrigation is the dominant purpose, and other purposes are subsidiary thereto. This policy has been followed in all other classifications made in Table III.

### **Forests**

The greater portion of projects included in this classification involve public works for the conservation and development of the national forests, and are under the jurisdiction of the United States Forest Service.

The program covers projects involving fire control, timber management, range management, watershed management, wildlife management, recreation, erosion control, forest community development, multiple-purpose management, administrative site improvements, communications systems, experiment stations, and general administrative projects, and development of forest roads and trails. The future program of construction of forest highways is not included in this classification, but is reported under "Transportation." Also excluded are nonstructural improvements which must be made concurrently with the undertaking of construction projects.

Most of the projects for structural improvements are small, costing less than \$7,500, and standard plans are available for their undertaking. With the preparation of detailed plans for construction of some of the larger projects, this program of forest development could be swiftly put under way as needed at any future time.



### Parks

The projects summarized in this group include for the most part those proposed by the National Park Service for improvements to national parks, monuments, historic sites, and recreational development areas. Parkways are not included but are covered under "Transportation." Projects are limited to those costing more than \$2,500, and to those involving structural improvements only. Principal types of construction projects are the building of structures and facilities for use in national parks, the restoring and rebuilding of national historic sites, and the development of a system of park roads and trails. In the West where park areas are remote from centers of population, living quarters for the supervisory personnel must be constructed and maintained, in addition to providing for accommodations for visitors.

Most of these projects are parts of general plans of improvement for the national parks, historic sites, and recreational demonstration areas, which have been prepared by the Park Service. Furthermore, construction plans for park buildings are generally standard or involve only minor deviations from standard plans. Such projects are therefore suitable for early construction in a program of post-war public works.

### Range Lands

For the first time, this year there is a comprehensive program for the protection and improvement of the range lands in the West by the Grazing Service. The program involves projects for fire control, for provision of both ground and surface water supplies, fence construction, building construction, soil and moisture programs, construction of trails and bridges, reseeding, and rodent control. Both structural and nonstructural improvements are thus included in this program.

Although the individual projects involved in the program are usually not large, the program as a whole represents over \$125,000,000 of work available for future undertaking. Inasmuch as the work is scattered over the 57 grazing districts including a large portion of the public lands in the Western States, this program may have particular value in providing work in large sparsely-populated areas. A large part of the work on projects of this type is now being carried on by the Civilian Conservation Corps.

### Wildlife

Projects in this classification include by and large the work programmed for future years by the Fish and Wildlife Service. They cover both the development of new and the rehabilitation of old fish cultural stations, and the expansion or enlargement of existing fish cultural stations where the potentialities of the sites have not been fully developed. Also included are projects

for the development and improvement of migratory bird and wildlife refuges, big game preserves, and the conservation of the Alaska fisheries and seal population. In total volume, this program is not as great as those for some other purposes, but it nonetheless is of extreme importance in the effective conservation of our resources. Most of the projects are small and are for construction of necessary operations buildings and control structures. The program is a part of the larger program involving, in addition, nonstructural improvements to the refuges and hatcheries.

With a relatively small amount of plan preparation, this program could be put into effect when needed at any future time.

### Promotion of Transportation

#### Rivers and Harbors

This program covers the projects of the Corps of Engineers for navigation improvements along the coasts of the United States and on the navigable rivers and canals throughout the country. It includes projects which, while active, do not involve any construction operations during the fiscal year 1943, and projects which are currently inactive but which may be undertaken at some future date.

Although this classification now comprises projects totaling \$97,000,000, it does not include any of the projects listed in the pending rivers and harbors bill now before Congress. Many of the proposed works included in the bill are the result of surveys completed during the year and listed in Table II. When the pending bill or similar legislation is passed, it is likely that most of the projects will become a portion of the reservoir of public works for future construction. As the present group of rivers and harbors projects becomes larger upon authorization of new projects, there will be available a substantial block of needed and desirable improvement work for which advance plans and specifications could be prepared.

#### Aids and Assistance to Navigation

The projects in this group are in the main those proposed by the Coast Guard for construction of new lifeboat stations, rebuilding of existing lifeboat stations, construction of additional shore facilities for the Coast Guard, construction of new light stations, the rebuilding of existing light stations, and modernization, additions, and improvements to existing shore facilities, lifeboat stations, light stations, and minor aids to navigation. The projects vary in size from very small improvements to major undertakings involving expenditures of several million dollars.

Since the defense emergency, and especially since the temporary transfer of the Coast Guard to the Navy Department, new construction has been concentrated

on projects important to defense, and non-defense projects have largely been deferred. This will undoubtedly result in a further increase in the size of the reservoir of projects from the present total of \$47,000,000.

#### Airports and Airways

The total of \$500,000,000 for projects in this classification covers two types of work:

1. The necessary construction to provide and improve the Federal Airways throughout the country.
2. The development and improvement of airports and landing areas.

With the exception of less than \$25,000,000 of projects for the airways development program, the projects are in airport and landing area development. Approximately 3,400 separate airport projects are included in the future program which is an outgrowth of the national airport survey conducted in 1939 by the Civil Aeronautics Authority. This survey originally recommended construction of some 3,900 airports, but under the defense program, approximately 500 of these have already been put under construction or are scheduled for construction in 1942 and 1943.

While the defense emergency has accelerated the airport construction program in some sections of the country, it has had relatively little effect in other sections. Accordingly, there will still be a large volume of projects suitable for early construction at the conclusion of the war emergency. Although airport planning and construction activities are now restricted to building airports for defense, this does not entirely preclude the preparation of plans for additional airports not at present needed for defense, but which in any event would have definite value in peacetime.

#### Roads

The bulk of the work available for later construction in this classification covers the construction and improvement of national forest highways. In addition it includes some projects under jurisdiction of the National Park Service, and projects of the Alaska Road Commission.

However, the complete development of the Federal-aid highway system and the various proposals now under study for the interregional highway systems would be probably undertaken as an activity of the Public Roads Administration in cooperation with State highway departments and city governments. As the Public Roads Administration is a construction agency (Class II), the complete development of this program is not included in Table III.

#### Railroads

The small program of work reported here is for the necessary construction and improvements on the Alaska Railroad. A large part of the program will be financed from the operating revenues of the Railroad.

#### Power Generation and Distribution

The program for power generation and distribution covers the projects of the Federal Power Commission, the Tennessee Valley Authority, and the Bonneville Power Administration. Although the total volume of power projects available for construction in later years exceeds \$1,690,000,000, there is some duplication with other purpose classifications, particularly in the case of multiple-purpose projects. When these duplications are eliminated however, the program still totals more than \$1,290,000,000.

The projects of the Federal Power Commission included in the table are for construction of hydroelectric power and transmission facilities. The Power Commission currently does no direct construction of power projects or transmission facilities, but does recommend such construction by other agencies of the Federal, State, and local Governments. The Federal Power Commission program summarized in this table carries projects of the Corps of Engineers which have not yet been authorized by Congress, and which therefore do not appear in the flood control or river and harbor classifications of projects reported by the Corps of Engineers. For example, the St. Lawrence Navigation and Power Project is contained in the Federal Power Commission program and is included in the \$1,290,000,000 total of future power projects. Because it has not yet been authorized, it does not appear in the river and harbor program reported by the Corps of Engineers.

The projects in the Tennessee Valley Authority program are for the further development of the unified river system under jurisdiction of the Authority. They include both hydroelectric power developments and the construction of transmission facilities, aggregating almost \$170,000,000. This future program is in addition to the large amount of construction by the Tennessee Valley Authority now under way or scheduled for 1942 and 1943, to provide power facilities for war production.

The projects of the Bonneville Power Administration comprise a part of their system for the transmission of power generated at Grand Coulee and Bonneville Dams and at other major projects which may be constructed in the Pacific Northwest. The long-term program for

construction of transmission facilities contains over \$130,000,000 of projects in addition to those under way or scheduled for construction during the 1943 fiscal year. National defense requirements have speeded up the construction program of the Bonneville Power Administration, causing a corresponding decrease in the volume of projects proposed for future construction.

## **Education, Welfare and Health**

### **Education**

Projects included in this classification cover the construction of buildings and improvements for Howard University, involving a total of almost \$7,000,000. Although the Bureau of Indian Affairs carries on some construction of educational facilities at Indian reservations, such projects are included in the general construction program of the Bureau of Indian Affairs, under "Welfare."

Federal participation in construction of educational facilities has been almost entirely through the medium of loans and grants to State and local governments by the Public Works Administration and other construction agencies (Class II).

### **Welfare**

With the exception of less than \$1,000,000 of projects for construction of buildings and facilities for the Columbia Institution for the Deaf, this group of projects totaling over \$101,000,000 covers construction proposed by the Bureau of Indian Affairs. Slightly over two-thirds of the program involves construction of roads and trails at the various Indian reservations and agencies, and the remainder consists of projects for buildings and facilities. All future projects of the Bureau of Indian Affairs, with the exception of those involving irrigation, are included under this "welfare" classification.

In general, standard plans are available for construction of many of the buildings and facilities proposed in this program, and the road and trail projects do not require involved or time-consuming plan preparation. A substantial proportion of the projects in this program could therefore be undertaken upon short notice.

### **Health**

The projects available for construction in future years are contained in the programs of St. Elizabeths Hospital, the Veterans' Administration, and the Public Buildings Administration.

The projects proposed by the Veterans' Administration involve the provision of additional beds at existing institutions as well as major reconditioning, remodeling, and repairs at such institutions, and the provision of entirely new facilities.

The Public Buildings Administration is the constructing agency for hospitals and quarantine stations under jurisdiction of the United States Public Health Service. The program submitted by the Public Buildings Administration consists of \$9,782,000 of such projects at present unauthorized for construction. In addition to this relatively small hospital program available for future construction, a much larger program is being studied by the Public Health Service. This expanded program would involve Federal aid to State and local units of Government for hospital construction, and would accordingly appear in the proposals of Federal construction agencies (Class II).

### **Prisons**

Projects in this group consist of those reported by the Bureau of Prisons for additions and alterations to existing Federal penal and correctional institutions, as well as construction of new institutions. Over two-thirds of the more than \$37,000,000 in projects entails new construction.

Inasmuch as most of the projects involve construction of buildings and facilities, detailed plans requiring considerable time for preparation are necessary before such projects can be started. Attention should be given to the preparation of plans for the more important of these projects, to enable construction to be started when needed.

## **Government Administration**

### **Office Buildings**

Construction is proposed by the Public Buildings Administration for projects to provide working space for Federal employees in the District of Columbia and in major regional centers throughout the country. The program includes over \$87,000,000 in projects, mostly in the District of Columbia. Buildings are also proposed by the Tennessee Valley Authority, the Bonneville Power Administration, and the Department of Agriculture to house their employees outside of the District of Columbia.

As the war activities of the Government increase, it may be necessary to construct some of the buildings now scheduled for the future. However, the trend has been toward the construction of temporary buildings in the District of Columbia and the decentralization of nondefense agencies to various other cities throughout the country, thus eliminating the need for much permanent construction.

### **Post Offices and Court Houses**

The projects contained in this classification include those unauthorized projects of the Public Buildings Administration outside of the District of Columbia

which are eligible for authorization if and when an expanded building program is undertaken. The projects total over \$130,000,000 of construction and cover approximately 6 years of work by the Public Buildings Administration at the past rate of expenditures.

#### Facilities for Law Enforcement

This group includes programs of the Immigration and Naturalization Service and the International Boundary Commission, involving the construction of border patrol stations and service facilities for personnel, and the provision of additional fencing along the United States-Mexico border. The total program exceeds \$14,000,000 of which all but \$1,000,000 consists of projects for construction of border patrol stations

and other facilities for the Immigration and Naturalization Service.

#### Research Facilities

Projects available for future construction and included within the total of \$17,900,000 for this group are from the programs of the National Advisory Committee for Aeronautics, the various research agencies of the Department of Agriculture, the National Bureau of Standards, and the Bureau of Mines. Although this group of projects does not involve a large construction program, the projects are important for continuation and expansion of the research programs of the various agencies.

### FEDERAL SIX-YEAR PROGRAM OF PUBLIC WORKS

TABLE III.—*Projects available for construction in later years*

Purpose classification	Estimated cost	Purpose classification	Estimated cost
<b>LAND DEVELOPMENT AND PROTECTION</b>		<b>POWER GENERATION AND DISTRIBUTION <sup>1</sup></b>	
Flood control.....	\$396,513,000	Total, power generation and distribution.....	\$1,294,159,000
Irrigation.....	220,985,326	<b>EDUCATION, WELFARE, AND HEALTH</b>	
Forests.....	222,216,356	Education.....	6,851,812
Parks.....	34,499,673	Welfare.....	101,356,966
Range lands.....	125,695,258	Health.....	38,855,500
Wildlife.....	9,405,250	Prisons.....	37,195,690
Total, land development and protection.....	1,009,314,863	Total, education, welfare, and health.....	184,259,968
<b>PROMOTION OF TRANSPORTATION</b>		<b>GOVERNMENT ADMINISTRATION</b>	
Rivers and harbors.....	97,926,376	Office buildings.....	87,156,000
Aids and assistance to navigation.....	47,866,823	Post offices and court buildings.....	131,948,000
Airports and airways.....	507,313,233	Facilities for law enforcement.....	14,127,000
Roads.....	478,119,133	Research facilities.....	17,886,000
Railroads.....	392,100	Total, Government administration.....	251,117,000
Total, promotion of transportation.....	1,131,617,665	Total, all classifications.....	3,870,468,496

<sup>1</sup> This estimate excludes hydroelectric power projects included in other purpose classifications. Including such projects the total estimate would be \$1,694,159,000.

## FEDERAL CONSTRUCTION AGENCIES (CLASS II)

The Employment Stabilization Act of 1931 requires that all construction agencies of the Government prepare and keep up to date 6-year construction programs, and Executive Order No. 8455 designates as "construction agencies (Class II)" all departments, independent offices and establishments, bureaus, agencies, and divisions of the Federal Government, including Government-owned corporations, which "aid construction activity through grants-in-aid, loans, or other forms of financial assistance, or through guaranties." Furthermore, the Executive Order provides that the construction agencies (Class II) shall prepare for the National

Resources Planning Board such reports on their surveys, plans, and 6-year programs as may be required. Currently, the necessary staff work is under way to develop the administrative procedures for making such reports.

Thus, the programs of the construction agencies (Class II) are not fully developed, and, in contrast to the previous section on the recommended program for construction agencies (Class I), only one part of the program, estimated construction financing by the Federal Government for the fiscal year 1943 (Table IV), is presented.

**Table IV.—ESTIMATED CONSTRUCTION FINANCING BY THE FEDERAL GOVERNMENT FOR FISCAL YEAR 1943**

This table includes estimates of the Federal share of construction to be financed by the construction agencies (Class II) during the fiscal year 1943 as recommended in the Budget of the United States Government.<sup>1</sup> The estimated cost of the Federal share of construction to be so financed by means of loans, grants, or guaranties of loans is \$2,184,276,000. The estimated Federal share of such financing during the last 10 years, classified according to the type of financing, is as follows:<sup>2</sup>

Fiscal year	Grants-in-aid	Loans	Guaranties of loans	Total, Federal share
1934.....	\$881,613,000	\$208,773,000	.....	\$1,090,386,000
1935.....	738,592,000	321,833,000	\$12,389,000	1,072,814,000
1936.....	1,317,962,000	233,464,000	195,412,000	1,743,838,000
1937.....	1,696,613,000	125,229,000	399,026,000	2,220,868,000
1938.....	1,255,785,000	122,600,000	427,003,000	1,805,388,000
1939.....	1,918,833,000	232,508,000	672,954,000	2,824,295,000
1940.....	1,307,925,000	452,473,000	702,647,000	2,463,045,000
1941.....	1,050,990,000	518,442,000	830,229,000	2,399,661,000
1942.....	797,805,000	682,765,000	1,071,500,000	2,552,070,000
1943.....	462,300,000	819,326,000	902,650,000	2,184,276,000

There have been several significant changes in the Federal financing of construction during the past few years. Federal grants-in-aid for construction have been dropping steadily since 1939, and the current estimate of about \$460,000,000 for Federal grants-in-aid is only approximately one-fourth of the amount so made available in 1939. On the other hand, Federal loans for construction have been increasing steadily since 1938 and, under the impetus of the war-time financing of defense industrial facilities, it is estimated that in 1943 they will be almost four times the amount in 1939, and almost seven times the amount in 1938. On the other hand, Federal guaranties of loans for construction seem to have leveled off at almost the billion-dollar mark, having risen steadily since their beginning in 1935.

<sup>1</sup> In some cases, the actual amount of the Federal share is recommended. In other cases, the estimated Federal share is determined by the Budget estimates of the administrative expenses required. Also, large amounts of these expenditures are contained in the so-called "Annexed Budgets."

<sup>2</sup> Figures prior to 1942 are actual. Figures for 1942 and 1943 are estimated.

It should be recognized that the estimates of construction to be financed by the Federal Government as presented in Table IV may be less or greater than the amount finally financed, depending entirely on two major factors:

1. The willingness of public or private agencies or individuals to assume the obligations required.
2. The availability of materials and men, particularly materials, for construction operations.

However, the estimates presented reflect the best judgment of the moment.

In order to explain in more detail the significance of the estimates, there are presented in the following notes brief explanatory data on the types of construction and financing that are involved.

## Federal Loan Agency

## Reconstruction Finance Corporation

The estimated total amount of construction financing to be undertaken by the Corporation and its subsidiaries during the fiscal year 1943 has been divided into two groups:

1. Loans to public agencies to aid in financing projects authorized under Federal, State, or municipal laws.
2. Loans for national defense construction.

It is difficult to estimate accurately the amount of construction that will be financed from the national defense loans made available by the Corporation. For one thing, many of its general defense loans, which are not made specifically for construction purposes, may in the end be so used. Furthermore, the Corporation has great flexibility in its operations in the financing of defense industrial facilities. For example, title to some of the facilities so financed will be retained by the Defense Plant Corporation, while they will be operated by private companies through a lease agreement with the Corporation.

In spite of the difficulties of making accurate estimates of the Corporations' loans, it would appear that the estimate of \$73,000,000 for loans to public agencies to finance the generally recognized "normal" type of State and local public works operations, and \$538,000,000 for construction under national defense loans are reasonable in the light of the currently anticipated operations of the Corporation.

None of the Federal financing involved will consist of disbursements from the Treasury.

#### **Federal Housing Administration**

The estimated volume of insurance to be written during the fiscal year 1943 will not represent a disbursement by the Federal Government. Rather, it will be an assumption of an obligation through the insurance fund that is maintained by the Federal Housing Administration. In general, the insurance written by the Federal Housing Administration covers two general types of loans: (1) those for the building of new structures upon urban, suburban, or rural property; and (2) those for building homes in the so-called "defense areas."

The first type of financing described above is represented in the estimated total of \$847,000,000 shown in the table, and is provided for under Title II of the National Housing Act.

The second type of financing described above is provided for under Title VI of the National Housing Act. The authority for insuring loans under Title VI of the National Housing Act, unless renewed by Congress, expires on July 1, 1942. However, any commitment to insure made prior to that date may still be assumed, and for this reason the amount of \$55,000,000 shown in the table is an estimate of the amount of insurance so committed prior to July 1, 1942.

If a further tightening of priorities and allocations regulations for building materials should occur, such action might very well have a depressing effect upon the volume of loan insurance to be written in 1943 by the Administration under Title II of the National Housing Act. For that reason, the estimate of \$847,000,000 may be much too high.

None of the Federal financing of construction involved in the Federal Housing Administration's operations will consist of disbursements from the Treasury.

#### **Federal Security Agency**

##### **National Youth Administration**

No estimates are immediately available of expenditures by the National Youth Administration during the fiscal year 1943 for the construction of training quarters, shops, camps, etc., for the work program of the Administration.

#### **Civilian Conservation Corps**

No estimates are immediately available of expenditures by the Civilian Conservation Corps during the fiscal year 1943 for the construction of buildings, structures, roads, etc., under the work program of the Corps.

#### **Federal Works Agency**

##### **Division of Defense Public Works**

The expenditures recommended for 1943 are for two types of financing operations authorized by Title II of the Lanham Act: (1) estimated disbursements on loans to States and municipalities for the construction of defense-connected public works; and (2) estimated grants to States and municipalities for the construction of defense-connected public works. Both these expenditures will be in the form of Treasury withdrawals.

It should also be noted that a part of the projects constructed with these funds are constructed and owned by the Federal Government, and the Government may operate or lease them for operation. Expenditures for this type of defense public works are shown in Table I.

The program undertaken by the Federal Works Agency through this Division is similar, in many of its operating respects, to programs of the Public Works Administration, the major exception being that grants and loans under the current program are not fixed but are on a sliding scale.

##### **Public Roads Administration**

The amount of Federal financing that is recommended for the fiscal year 1943 under the Public Roads Administration will be for three purposes:

(1) The grants provided for highway construction under the regular Federal Aid Highway System acts will total \$58,000,000.

(2) The construction of Federal-aid secondary or feeder roads out of the regularly authorized appropriations, involving a recommended expenditure of \$8,000,000 for grants.

(3) Construction expenditures for the elimination of hazardous railroad grade crossings under authorizations of the Congress. Recommended expenditures are set at \$23,000,000.

All these expenditures will be in the form of withdrawals from the Treasury.

##### **Public Works Administration**

The expenditures recommended during 1943 are for two types of financing operations: (1) disbursements on loans to States and municipalities for public works construction; (2) grants to States and municipalities for public works construction. Both these expenditures will be in the form of Treasury withdrawals.



The Federal financing undertaken by the Public Works Administration during the fiscal year 1943 will involve only about \$11,000,000, for the program of the Administration has been practically completed, and the grant and loan payments for which expenditures are shown will, in effect, close the program. The grant and loan payments follow the completion of construction operations, and while construction has been completed, or at least nearly so, on practically all of the projects financed by the Public Works Administration, the grant and loan payments are in many cases being held up until final settlement is made to the satisfaction of the Administration.

#### **U. S. Housing Authority**

The figure of \$150,000,000 for the Federal financing of construction expenditures by the Authority during 1943 through loans to public housing agencies does not include the annual contributions that are made to the housing authorities by the Federal Government. This Federal financing is not a Treasury disbursement. It is disbursed from funds made available through special obligations issued by the Authority and guaranteed by the United States.

#### **Work Projects Administration**

The estimated expenditure of \$279,000,000 that is recommended for 1943 is a part of the supplemental work relief appropriation of \$465,000,000 contained in the Budget. These funds will be withdrawn from the Treasury during the year. The construction to be undertaken will also involve an expenditure by the State and local governments concerned from their own funds concurrently with the grant-in-aid provided by the Work Projects Administration.

The construction projects undertaken will include all types of State and local public works.

### **Department of Agriculture**

#### **Farm Credit Administration**

Construction to be financed by the Farm Credit Administration during the fiscal year 1943 consists of buildings, structures, etc., constructed under loans made through the financing facilities of the Administration. The funds so used will not be Treasury disbursements.

#### **Farm Security Administration**

Construction to be financed by the Farm Security Administration during the fiscal year 1943 is of two types: (1) that undertaken under the rural rehabilitation loans; and (2) that undertaken under loans through the Bankhead-Jones Farm Tenant Act. For the first type, it is estimated that about \$4,500,000 will be used for construction; and that almost \$10,000,000 will be used for construction under the farm tenancy loans.

#### **Rural Electrification Administration**

The estimated \$20,000,000 of Federal financing in 1943 is for the construction undertaken by means of Rural Electrification loans. These funds are made available to the Rural Electrification Administration from a loan advanced to the Administration by the Reconstruction Finance Corporation. None of these estimates are duplicated in the estimates shown for the Reconstruction Finance Corporation.

#### **Water Facilities Program**

The expenditure of \$1,500,000 that is recommended for 1943 is for the purpose of providing small dams, structures, etc. in the arid and semi-arid regions of the country in order to carry out the provisions of the Water Facilities Act of 1937 as amended. The assistance is rendered in the form of grants and loans to private individuals. The work undertaken follows carefully studied area plans as developed through the Bureau of Agricultural Economics, with the cooperation of other agencies in the Department, and as approved by the Department's Water Facilities Board.

## FEDERAL 6-YEAR PROGRAM OF PUBLIC WORKS

TABLE IV.—Estimated construction financing by Federal Government for fiscal year 1943

Name of agency	Type of financing	Total estimated Federal financing of construction
<b>FEDERAL LOAN AGENCY</b>		
<b>Reconstruction Finance Corporation:</b>		
Loans to public agencies to aid in financing projects authorized under Federal, State, or municipal law under Section 5 (d) of the Reconstruction Finance Corporation Act, as amended.	Loan.....	\$73,000,000
Loans for national defense construction.....	do.....	538,510,000
Total, Reconstruction Finance Corporation.....		611,510,000
<b>Federal Housing Administration:</b>		
Small home mortgages and rental and group housing mortgages (exclusive of modernization and property improvement notes insured); Title II, National Housing Act.	Insurance of loan.....	847,000,000
Small home mortgages in defense areas; Title VI, National Housing Act.....	do.....	55,650,000
Total, Federal Housing Administration.....		902,650,000
Total, Federal Loan Agency.....		1,514,160,000
<b>FEDERAL SECURITY AGENCY</b>		
<b>National Youth Administration:</b>		
Aid in the construction of training quarters, shops, camps, etc., for the work program.....	Grant-in-aid.....	(1)
Total, National Youth Administration.....		(1)
<b>Civilian Conservation Corps:</b>		
Construction of buildings, structures, roads, etc., under the work program of the Corps.....	Grant-in-aid.....	(1)
Total, Civilian Conservation Corps.....		(1)
Total, Federal Security Agency.....		(1)
<b>FEDERAL WORKS AGENCY</b>		
<b>Division of Defense Public Works:</b>		
Loans to States and municipalities for defense-connected public works construction.....	Loan.....	13,600,000
Grants to States and municipalities for defense-connected public works construction.....	Grant-in-aid.....	85,000,000
Total, Division of Defense Public Works.....		98,600,000
<b>Public Roads Administration:</b>		
Federal-aid highway system.....	Grant-in-aid.....	58,000,000
Federal-aid secondary or feeder roads.....	do.....	8,000,000
Elimination of grade crossings.....	do.....	23,000,000
Total, Public Roads Administration.....		89,000,000
<b>Public Works Administration:</b>		
Loans to States and municipalities for public works construction.....	Loan.....	1,775,000
Grants to States and municipalities for public works construction.....	Grant-in-aid.....	9,300,000
Total, Public Works Administration.....		11,075,000
<b>U. S. Housing Authority:</b>		
Loans to public housing agencies.....	Loan.....	150,000,000
Total, U. S. Housing Authority.....		150,000,000
<b>Work Projects Administration:</b>		
Work relief construction (excluding work-relief nonconstruction) for State and local public works construction.....	Grant-in-aid.....	279,000,000
Total, Work Projects Administration.....		279,000,000
Total, Federal Works Agency.....		627,675,000

(1) No estimates immediately available.

TABLE IV.—Estimated construction financing by Federal Government for fiscal year 1943—Continued

Name of agency	Type of financing	Total estimated Federal financing of construction
<b>DEPARTMENT OF AGRICULTURE</b>		
<b>Farm Credit Administration:</b>		
Construction of buildings, structures, etc., under loans through the Administration.....	Loans.....	\$6,375,000
Total, Farm Credit Administration.....		6,375,000
<b>Farm Security Administration:</b>		
Construction of buildings, structures, etc., under rural rehabilitation loans.....	Loans.....	4,536,850
Construction of buildings, structures, etc., under loans pursuant to Bankhead-Jones Farm Tenant Act.....	do.....	9,960,000
Total, Farm Security Administration.....		14,496,850
<b>Rural Electrification Administration:</b>		
Loans under Rural Electrification Act of 1936, as amended.....	Loans.....	20,000,000
Total, Rural Electrification Administration.....		20,000,000
<b>Water Facilities Program:</b>		
Loans for the construction of dams, structures, etc., under the Water Facilities Act.....	Loans.....	1,420,000
Grants for the construction of dams, structures, etc., under the Water Facilities Act.....	Grants.....	150,000
Total, Water Facilities Program.....		1,570,000
Total, Department of Agriculture.....		42,441,850
Grand Total, Construction Agencies (Class II).....		2,184,276,850















